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ABSTRACT

A variety of environmental education activities, created by Alaskan teachers who have participated in the State Department of Education's Environmental Education Community Workshops, is presented in this compilation. The curriculum plans, environmental experiences, and simulation games for elementary and secondary levels are developed in outline form for simplified use. Where appropriate, they state title of the activity, author, grade level, goals, concepts, behavioral objectives, activity design and implementation, and teaching procedure. Materials required to conduct the experience are noted when necessary. The plans/experiences/games are multidisciplinary, covering a wide range of environmental topics. (BL)

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CLOSED SYSTEM

AN ENVIRONMENTAL EXPERIENCE FOR A SECOND GRADE CLASS

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Principle: Matter can neither be created nor destroyed.

Generalizations: (1) The earth, like a spaceship, presently contains all the air, water, and soil it will ever have; and natural resources are limited.

(2) Air, space, food, or water, can be a limiting factor to a population in any environment.

Concepts:
Environment
Air
Water
Soil
Resources
Spaceship
Earth

Behavioral Objectives: At the successful completion of this environmental experience, each student will be able to:

1. Verbally compare and contrast the planet earth and a spaceship with regards to air, food, and water.
2. Discuss the term environment as to include both the natural and cultural aspects.
3. Differentiate between finite and infinite by giving examples.
4. Give two examples of recycling--one cycle that occurs naturally and one cycle concerning man made materials
5. Discuss the term interrelationship as to cite examples of natural and cultural interrelationships.

Activities - Outer Space: Develop the concept that the earth is merely a small part of a very large system. The earth is the only planet we know for sure that has the ability to support life, as we know it.

Build a Universe out of cardboard -- stars, planets, moons in relative size. Have each child make an earth -- compare it to the universe.

Space Travel: From empty appliance boxes, build a model of a spaceship. Have students determine all the necessities -- food, oxygen, water -- a closed system. Plan a simulated flight. Determine how much food, air, water, you will need. How many people will be on board? What if five extra people want to go, would you allow them to go?

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Spaceship Earth	Make a collection of pictures representing life on earth. Make captions for each picture which explains life support systems such as air, water, and soil.
Mini World	Develop a small replica of the earth. Are resources and space endless? Compare and contrast the spaceship with the mini earth -- the real earth.

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INVESTIGATIONS OF POSSIBLE OUTDOOR SCHOOL SITES

An Environmental Experience For Upper Elementary Students

Created By: Lani Perry
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Goals: The goal of this experience is to develop an awareness of the possibility of an extended school site, what should be included in this site and what ecological studies can be developed within a site.

Activity Design

Task A: Discussion

What can we study outdoors? What would we need to know before selecting and obtaining a site for outdoor studies? Would it be possible for us to have a study-site near our school? Where? How would we go about finding out?

Encourage the students to express their feelings. Perhaps they might want to divide into small task forces and collect and record data on the procedures used in obtaining an extended school site.

Task B:

Take a class hike to the site area. Encourage the pupils to notice the different types of communities. Inventory such things as --levels of vegetation, importance of light energy, animal evidence, forces affecting life and growth of trees and plants in area, muskeg area, different types of trees and how their environmental needs differ, quiet place to be creative, signs of man having been there.

Task C:

Lead the class in making a general list of the characteristics and natural features noticed on visit to site. Have the class put them into groups.

Guide the students into a discussion of the most desirable characteristics of an ideal extended school site. Culminate the discussion by asking them to compare their "ideal" site to the one just surveyed. Would the possible school site be a good outdoor laboratory? Why?

Task D:

Show the film "Patterns of the Wild" to the class. Discuss the interdependence of all living things. Through Tasks E, F and G extend and reinforce the concept that all living and non-living things depend upon each other. Plants require nutrients from the soil in order to grow. Animals eat plants and other animals. Animals and plants decompose and thus become a part of the soil. The cycle is never-ending.

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Task E:

Introduce the Web of Life game. After the game, discuss the importance of maintaining a balance in nature. By not realizing the intricacies of the different communities, man has often unwittingly upset things.

THE WEB OF LIFE

Background Information

The aim of this lesson is to illustrate how living organisms depend upon natural resources for life and what happens when a resource is removed. Constructing a community web of string helps to show how involved one factor such as water, soil, air, sun, or even an organism can be, and how the balance is upset when such a factor is removed. Without a knowledge of the intricacies of the web of a community, man sometimes unwittingly upsets things, either by introducing a factor that was not present before, or by removing a factor that seemed unimportant until it was gone.

Materials Needed

Ball of string (or strong thread)

Activity

Give one labelled card to each of four students.

1. Sun
2. Air
3. Water
4. Soil

To each remaining member of the class distribute a card naming a common plant or animal such as grass, mouse, hawk, cow, man, earthworm, robin, garter snake, and so on. Remember to give some of the names of parasites, scavengers, and decay bacteria, too. Seat the class members in a circle. Now connect the child labelled sun with all the other children whose cards indicate a direct relationship with the sun. For example; a string should connect the sun with grass, mouse, hawk, man, earthworm, and so on . (plants and animals that need to see their food). Continue doing the same for air, water, and soil. Consider what the web would be like if you added another ball of different colored string to represent indirect relationships (earthworm needs sunlight because it eats leaves and they need sunlight). To show all indirect relationships would be hard to handle, but it is worth considering and discussing. After the direct relationships are shown by the string, think what would happen if one important factor was eliminated. In a marsh, draining would remove the water - one of its most important sources of food and shelter. In the web constructed with the class, let one of the individuals (water for example) drop his strings and see what happens to the rest of the web. Can you see that a general collapse sets in? Discuss how other resources might be removed and what effect this would have on the web.

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Task F:

Create several miniature environments in the classroom. Several miniterrariums could be in existence. By observing, classifying, and measuring, students could predict possible outcomes in various interrelationships.

Example: A food chain is a beautiful way to show interrelationships. Using the plants and animals found in the minicommunities construct a food chain. Remember one depends upon the other!

Task G: On-site study of a rotten log.

1. Lead the students into observing what lives on the top, sides, and bottom of the log. Give them a 10 minute observation period. Allow them to develop classification keys for the plants and animals found. Then ask the students how one living thing affects the other.

2. Sketch a food web of this miniature environment that uses as many of the organisms observed as possible. A food web is made by placing the names of various plants and animals observed in this environment on a sheet of paper. Spread the names out and then draw arrows from the organisms that eat other organisms.

3. From your study of the rotten log and the interrelationships observed, lead your group into the creation of a diamante.

   Diamante is easy to write. You don't have to worry about rhyme or rhythm. But you do have to know the parts of speech! The formula is:

   1. one noun
   2. two adjectives
   3. three participles
   4. four related nouns
   5. three participles
   6. two adjectives
   7. one noun

   Now turn the formula into a poem! Remember, diamante is a contrast poem. Here is an example:

   Sea

   Salty, wet

   Drowning, swimming, floating

   Waves, whitecaps, drifts, formations

   Rolling, expanding, settling

   Solid, firm

   Land

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Task H: Enrichment Activity:

Observe and record everything living and non-living in area around the rotten log. After a two week period return and observe for possible changes. Did you observe anything the second time that you didn't see the first time?

Task I: Selection of an ideal extended school site:
Implementation: On-site use of compass, mapping, group working, games.

Activity: Introduction to use of compass

1. Compass....Name parts, use, problems
2. Pacing....Mark off a 100 foot course.
   Walk the course three times, counting your steps.
   Average your steps.

Activity: Following a written course.

1. Students follow course teacher has written out.
2. Students write their own course.
3. Follow-up....games (Boy Scout compass game).
   treasure hunt
   timed course run

Activity: Mapping

1. Study maps of community area.
   Question: What is necessary to make a map?
2. Discuss parts of map: N arrow, scale, legend.
   What symbols will be needed to map this area?
   Agree on uniform symbols.
3. Walk area to be mapped. (Area students will use in simulation game). Keep a record in your field notes.
4. Draw map: select map scale, determine N direction, orient map paper with compass. Make dot on paper to indicate starting point. Turn compass to first degree reading. Measure correct distance and draw line. Draw in landmarks. Repeat for other degree readings.
5. Maps can be used in simulation game or exchanged and used by other students. Perhaps the individual maps could be put together for a large mural map of the area!

Task J: Land Use Simulation Game

Simulation games are fun. The students tend to become deeply involved in the issue at hand---which is the idea! Through the simulation game and the following personal inventory list (Task K) you may deepen their committment to find ways and means to improve the environment. The simulation game is presented here exactly as written for use by Glacier Valley School students in Juneau, Alaska. By using this model you can create a similar game for your proposed available land.

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LAND USE SIMULATION GAME

Issue --- The problem to be decided is what are some possible uses of the 400 acre plot of land located between the Glacier Valley School and the proposed Floyd Dryden Junior High. This land is not on Loop Road.

Materials-Scrap paper for note-taking, white butcher paper and felt pens for a visual presentation (such as a land use map drawing).

Procedure-Introduce the issue to the class. Indicate that it is a real life situation - one that affects their community. Some of the following factors might be discussed with the class as a whole to help prepare them to make some decisions.

1. Background Information.
   a. State owned - tenatively offered to the Greater Juneau Borough
   b. Foothills of Thunder Mountain.
   c. Easily accessible to Mendenhall Valley residents.

2. List possible uses of land. From this list of 15 to 20 have the students group them into major categories, i.e., Recreation, Housing, Commercial, etc.

After general discussion, the class should be divided into the number of categories decided on earlier.

1. Each group is to represent the category assigned.
2. Each group will have 15 minutes in which to analyze and list:

   a, Use of land
   b. Advantages to land/people.
   c. Disadvantages to land/people.

After the 15 minutes you should instruct the group that they have 20 minutes to plan a strategy and develop a 3 minute presentation to be made to the Borough.

1. This presentation will be a proposal for developing the designated area.
2. There must be a visual display such as a land use map drawing as a part of your presentation.
3. More than one person in your group must take part in the presentation.

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Ten minutes into the strategy session, you should select one person from each group to act as a member of the Borough. Take the Borough members into another room and tell them they will be responsible to hear the different groups and decide which one gives the best presentation.

1. Borough's job in the next 10 minutes:

    a. Select a chairman to call on groups.
    b. Decide what they will use to evaluate the proposals based on needs of people and characteristics of land.
    c. Plan a form you can use in evaluating the presentations as they are given.

Remind the groups 8-10 minutes ahead of time to be prepared with their oral and visual presentations. Be flexible about time!

Have Borough members enter and sit facing the groups. Appoint someone as timekeeper. There will be 3 minute presentations with 2 minutes warning! No rebuttals or discussion.

The Borough should retire for 5-10 minutes to consider proposals.

While Borough is out, the different groups should consider what type of questions they would have asked.

Borough should announce their decision as to the best proposal and the reason for their choice.

Perhaps one of the most important parts of the game will be the culminating discussion. The class should be encouraged to consider what additional data you would have liked on hand for your groups. Should you have known such thing as: who owns surrounding land, cost of land, soil survey, population needs, etc.?

Note: When the Land Use Simulation Game is used in connection with the curriculum plan Investigation of Possible Extended School Sites the teacher should be encouraged to see that the local school board appear as one of the major categories. Thus placing the school board in a position to speak for the area as an extended school site for either Glacier Valley, Floyd Dryden Junior High, or both.

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Task K:

Let pupils make up a personal inventory list of ways they have discovered to benefit their environment. Allow them to share their lists with their classmates. In this way they have evaluated the study of an extended school site.

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INVESTIGATING THE SCHOOL ENVIRONMENT

An Environmental Experience for Elementary Students

Created By: Polly Dewey
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Goals:

1. Provide students with an awareness of the interrelationship of the people and materials within their own school environment.
2. Provide students with an awareness of the interdependence of the school and the community.
3. Provide an awareness that things in the school environment are subject to change and adaptation.
4. Provide students with an awareness of the problems existing in the school environment.
5. Help students to recognize their role in maintaining and improving the school environment.

Activity Design and Implementation

Following an introduction to the study by group discussion, the students can be given investigation papers. There may be one or more papers for each area of the school environment that is to be investigated. The scope of the study of the school environment is such that it could take two to three months to complete. Students will most often work in groups, but some activities suggest individual study. For the most effective group work, there should be no more than five to a group. Students should choose a chairman and a recorder. A sharing of the student's findings and group discussion will comprise the summary of interpretaions and point out needs for follow-up study. Materials needed include telephone directories, maps, tape recorders, measuring tools, compasses, hand lenses, microscope, paper and writing tools, cardboard for writing pads.

1. Introduction To The Investigations of the School Environments

Method: Teacher introduction, followed by group discussion to identify and classify areas to be studied.

Help the children to think of the school as a community. "What are the things we need to keep it going?"

As children make suggestions teacher will write them on the chalkboard.

Categorize items on the list by asking children to "give a letter to all the things on the list that are alike."

Help the children to name (identify) the major groups.

Tell the children that to help them in their investigations of these groups, you have activities for them to do. Explain that the investigation papers have both questions and things to do.

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Explain that children will work in groups unless teacher specifies that the activity is an individual one.

Ask the children to select their chairmen and recorders.

II. Investigation of the School Building

1. Take a walk around the inside of the school. Look carefully and write down the things you see. Count the number of rooms on each side of the hall; count the number of doors going outdoors; (it might help you to make a little drawing as you walk); look for special rooms such as the office, library, boiler room, etc.

2. Make a large drawing (or diagram) of the inside of your school. Label each room.

3. Find out if all the rooms have been used as they are now. You may ask the principal, custodian, or teachers who have been in the building for a long time.

4. Make a list of the different colors of paint used in the building. How do some of these colors make you feel?

5. Draw the different shapes of windows that you see in the school.

6. Learn when this school was built. Look at a map or picture that shows what the land looked like before the school was built.

7. Go outside and look at the land around the school. Do you see any changes?

   a. Make a list of all the things that are different.
   b. What do you think it will look like in 10 years? (How old will you be in 10 years?)

8. Using the length of your own step, measure how many feet there are around the school property.

9. Make a map of the outside of your school showing where the school is located. What is the shape of the building? Look at roads around the building. Are there mountains, ponds, houses, stores, or trees? What things can you see far away? What things are close to the school?

10. Using colored chalk or crayon, make a picture of the outside of your school.

11. Your teacher will help you to learn how to read a compass. List the words we use to show direction. Show the directions on the map you made of the school.

12. Look at a real topographical map of the area made by the U.S. Geological Survey. Can you tell where your school should be?

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III. Investigation of Maintenance (Taking Care of the Building)

Building Maintenance (Inside)

1. Talk with the custodian to learn what things are done to keep the school clean and looking nice.

2. How many people are needed each day to take care of the school?

3. Make a list of the machines and materials used to take care of the school.

4. Which part of the cleaning do you think takes the longest to do? Ask the custodian.

5. Ask the custodian to show you what is done with the dirt, paper and other waste products that come from the classrooms and other rooms.

6. Walk around your classroom and in the hallways. What kinds of litter do you find? What should you do with it?

7. What do you do when you see someone littering? Indoors? Outdoors?

8. Find out if there are any laws against littering.

9. Walk around the inside of the building and make a list of the things that need to be repaired.

10. As you walk around the outside of the building, make a list of things that need to be repaired.

11. Think of one way you have seen a student who was not taking care of our building.

12. Think of one way you have seen a student who was caring for the school building.

13. Think of some things or ways to make our school more comfortable.

14. Ask the custodian to show you what is done with the garbage from the school lunches.

15. Keep a record for three days of the kinds of things people put in the garbage cans after lunch. If it is mainly paper, check in the paper column. If it is food and a milk carton, check that.

	Food	Milk Carton	Paper	Plastic	Metal
Day 1					
2					
3					

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16. Think of some ways to cut down the amount of garbage our school has. Have a contest with the other groups in your class to see who has the most ideas.

17. Could the garbage have any good uses? Name some uses.

18. With your teacher, plan a trip to the dump to find what happens to waste products.

19. Think of a way the land (dump area) could be used for something else.

20. Did you discover anything else about taking care of the school or about waste products?

IV. Investigation of the People at Your School

1. You know there are many children in your school, but think of all the other people who work or help at the school. Make a chart that shows if the people are in the school all day or just part of the day.

Name of Worker	Here All Day	Here Part of Day
Teacher	X	

Think of helpers such as the nurse, secretaries, library helpers, special teachers, etc.

2. Interview these people to learn what their job is like. Before you interview, learn how to do it politely. Make a list of your questions before you talk with the people. (You may use a tape recorder.)

3. As the school secretary to give you a count of the number of children in each classroom. Make a graph that shows the number of children at each grade level. (Remember that there is more than one third grade.)

4. Using the information you have collected, tell how many children are in the whole school.

   a. Tell how many children are in grades 1, 2, and 3.
   b. Tell how many children are in grades 4, 5, and 6.
   c. Which group has more children? How many more?

5. Talk with the principal to find out how many children were in this school five years ago. Were you in school then? Was this number more or less than the number of children here now?

6. Talk with the principal to find out how many children are in the other schools in your community. How do their numbers compare with ours?

7. Take a look at one classroom at each grade level. Observe how the furniture was arranged in each. Were the children all sitting at their desks, or were some moving about? What did it sound like in each room? What did it smell like in each? What kind of feeling did you get in each room?

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8. Using the daily schedule paper, decide at what times of the day

   a. most children are in the building.
   b. few children are in the building.

9. By standing shoulder to shoulder, decide how many could stand across the hall.

   a. Decide how many children could comfortable walk in opposite directions.

10. Make tape recordings of the noise in your classroom at four different times during the day.

    a. At what time was there the most noise?
    b. At what time was it the most quiet?

11. Go out on the playground; make a list of the sounds you hear. How do they make you feel? Go out when no other children are near.

12. At recess time on the playground, make a list of the sounds you hear. How do they make you feel?

13. Mark off a small corner of the classroom. Use bookcases, screens, etc. for dividers. Plan for your group to stay there for part of the day. Put your desks there. Once you enter this space do not come out for any reason until your time is up.

    a. What did you like about doing this?
    b. What didn't you like?

V. Investigation of Energy Sources

Heat

1. Talk with the custodian to find out how your school is heated.

   a. What is used for fuel?
   b. Where does it come from?

2. Ask the custodian to show you where the fuel is used and what for.

3. Call the school business office to learn how much fuel is used in one month.

   a. Who pays for this?
   b. Is more fuel used some months than others? Why do you think more is used?

4. How do we tell how warm a room is? Read the temperature in six rooms and record your findings.

   a. Did all the rooms have the same temperature?
   b. Why might we want to have some rooms cooler than other?

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5. Write down two ways that we help save some of the heat in our school.

   a. What are two more ways that we could help save some of the heat?

Electricity

1. Name the energy or power used by the lights and some machines in the school.

2. Where does this power come from? How does it get there?

   (Teacher may arrange a trip to the power plant.)

3. How do people measure how much of this power is used? Is this like anything you have in your home?

4. Estimate how much money it might cost to use this power in our school for one month. Call the business office to learn how much it cost. Was your estimate close?

5. Count the number of lights in each room.

   a. Ask the custodian how often new lights have to be put in.

6. Walk around the outside of the school. Are any lights used outdoors?

   a. Are any lights needed outside? If so, where?

7. Are the lights in the halls different from the lights in the classrooms?

8. Find out how many kinds of machines in the school use electricity.

9. What are some ways we could help save (conserve) this power?

10. Did you discover anything else about electricity that was not asked on this paper?

Water

1. Make a list of all ways water is used in our school.

2. Where does the water come from for our school?

   a. How does it get into the school?
   b. Compare this to the way you get water in your home.

3. Take a sample of water from the sink faucet. Look at it under a hand lens or microscope. What do you see?

   a. Take a sample of water from a puddle outdoors. Look at it under a hand lens or microscope. What do you see?
   b. Which of these samples would you rather drink?

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4. Ask someone from the Department of Health to tell you how the water is checked to be sure it is safe to drink. Is anything added to the water before we drink it?

5. Ask the custodian to tell you what happens to the water and sewage once it goes down the drain.

6. Find out what haqpens to the dirty water in your home.

7. Does it make any difference where the sewage and dirty water goes?

8. Make a mural showing all the ways people can use water for work and play.

Food - Energy for People

1. Where does the energy come from that makes the people in our school keep going?

2. Make a study of the lunch program in your classroom.

   a. How many children in your own class usually bring their own lunch?
   b. How many children usually go home for lunch?
   c. How many children usually buy hot lunch?

3. Make a study of the hot lunch program in your school.

   a. Talk with the school secretary to learn how many children might buy hot lunches in one day. In one week.
   b. Why does the secretary have to know early in the morning how many people are planning to eat hot lunch?
   c. Talk with the principal or custodian to learn where the lunches come from. Who makes them? How do they get there? When do they usually get there?
   d. Talk with the kitchen helpers to learn what they must do to get the food ready to serve.
   e. Visit the kitchen to see some of the equipment. What uses do these things have?
   f. Ask the kitchen helpers what happens to the tickets that are collected each day.
   g. Does the lunch cost the same for everyone in the school?

4. Make a (survey) of one of each grade level in the school to find out:

   a. What foods most children like
   b. What foods most children don't like
   c. If children usually get enough to eat
   d. If children usually don't get enough to eat
   e. Which kinds of food they usually throw out
   f. If they like plastic forks

5. Find out who it is that plans the menus for the school.

   a. Do you think this person might have to have any special training to do this?

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(Teacher could bring in dietician to discuss diet, ordering quantity food, etc.)

6. Write a paragraph telling about your favorite food and about the food you dislike the most.

7. Pretend that you are the school dietician. Plan the school lunch menu for one week. Have the class vote for the menu they like best.

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INITIAL ENVIRONMENTAL AWARENESS AT THE KINDERGARTEN LEVEL

An Environmental Experience for Kindergarten Students

Created By: Deborah Johnson
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Goals: The general goal of this Unit is to provide the students with an awareness of each other and an experience in cooperative learning; an awareness of the many types of environments with which they come in contact in everyday life, and an awareness of problems that involve these environments and their (the students') part in solving some of these problems.

NOTE: Each session included in the plan is necessarily brief and intended to encompass a time period of no more than 20-25 minutes, unless the activity section includes an exploratory project; in which case the time period can be extended to 30-45 minutes.

Activity Design

SESSION 1:

Objective: That the children gain an awareness of each other, singularly and as a group.

Implementation: Student observation and discussion.

Procedure: The teacher may begin by introducing the following discussion questions:

1. How many children are in this class?
2. How many boys are in this class? How many girls?
3. How else can we describe, or talk about the people in our class? (Possible responses here could be: by names, by physical simularities and/or differences)

Activities:
a. Have one child stand before the group and be blindfolded. Ask him to describe himself. (This description can be from any reference point.)
b. Have the children as a goup close their eyes and describe "you" (the teacher).

SESSION 2:

Objective: That the children gain an awareness of the school and classroom environments.

Implementation: Student observation and discussion in comparing areas and other environments.

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Procedure: The teacher may begin by asking the children to take a walk around the room and count their steps in an attempt to discover how large the room is in actual space. Here is also an opportunity to help a child realize differences in measuring space. (i.e.--perimeter vs. area).

Questions: (To follow exploratory activity.)

1. How large is the room:
   a. in relation to the child's home?
   b. in relation to the hallway?
   c. in relation to the playground?
   d. in relation to the other rooms in the school?
2. Is the room big enough for the number of children we have?
3. Is the room pretty? (attractive?)
4. What are some problems about the room? (litter, space, etc.)
5. How can we improve the room? (The teacher will write down the list of suggestions.)

SESSION 3:

Objective: That the children gain further awareness of problems existing within the school environment, particularly those dealing with lettering.

Implementation: Simulation game; in form of student survey.

Procedure: Assume: That the children arrive at the hypothesis that litter is a prime problem in the room and the school.

Step 1: Divide the group into three sections of "detectives"
   a. One group will go to the principal and to the janitor in an effort to find out if these people feel that littering "inside" the school is a problem.
   b. The second group will visit three or four other classrooms to find out if they have litter problems in their rooms or have noted them elsewhere.
   c. The third group will remain in the classroom, and pick up litter, noting where the most litter is found.

Step 2: The three groups will meet together and report their findings. The teacher should guide the discussion in order that the children ascertain the areas within the school and classroom where the litter problem is the greatest.

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Activities: A. If there is time, a map of the room may be made with symbols indicating the areas of heaviest litter concentration.

SESSION 4:

Objective: That the children gain an awareness of the whys of littering as a problem in and around the school.

Implementation: Simulation game utilizing role playing

Procedure: Step 1: The teacher will choose two individuals, or groups designating one gorup the "litterBAGS", and the other the "litterBUGS".

The first group will be defined as those who pick up litter; and the second as those who drop litter.

Step 2: As the remainder of the group observes, the teacher should assign roles within the groups (or to the individuals).
Examples of some roles she might assign are:
a. She may ask a "litterBUG" to eat a piece of candy and drop the paper on the floor. She will then ask a "litterBAG" to pick it up.
b. She may give a "litterBUG" with many papers to carry from one place to another. Again, the "litterBAG" will pick up any litter which falls.

Step 3: Following the role playing, the teacher should ask the group to suggest or think about some of the whys for the behavior of the "litterBUGs", and how to overcome them.

SESSION 5:

Objective: That the children summarize their findings on the school environment and its problem of littering, and become aware of some of the ways they, as individuals, can help solve the problem.

Implementation: Class discussion and follow up on ideas.

Procedure: The teacher should lead a general discussion on the activities of the previous sessions, and leave ample time for the children to voice their feelings and observations.
Some possible results and conclusions may be:
a. We should remind each other not to litter.
b. We should pick up litter even if we didn't drop it.
c. Teachers should be reminded not to send home too many papers at one time.
d. ??? Whatever else the group comes up with.

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Activities: a. Make anti-litter posters to be put up as reminders around the room and school.
b. Prepare a letter, in ditto form, to all teachers regarding "over-loading" students with papers to take home.
c. Perhaps another activity according to group concensus.

Revised by: Jo Michalski
Environmental Education
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"A PENNY SAVED IS A PENNY EARNED"

CREATED BY: Margaret Brown
Box 243
Skagway, Alaska

TO BE USED WITH: Elementary Levels 1-3
(could be adapted to all elementary levels)

GOALS: To develop an awareness among students that money has value, and that regular saving of it is a problem common to them and to initiate a savings program for students at the school.

Activity Design

Session 1:

Objective: That the children gain an awareness of money values.

Implementation: Student observation and discussion.

Procedure: The teacher will pass out to groups of children, coins of varying values, and then pose the following discussion questions:

1. What is the name for this coin?
2. What is its value?
   (This procedure will be followed through discussion about each coin.)
3. What could you buy with a penny, a half-dollar, etc.?
4. How many pennies or nickels would you need to buy as much as a dime would buy?
   (This procedure will be followed through various other combinations, arriving at equal values.)

Session 2:

Objective: That the children develop an awareness of values in relation to lesser and greater.

Implementation: Student observation and discussion in comparing familiar, concrete objects of lesser and greater value.

Procedure: The teacher may begin by introducing the following questions for discussion:

1. What do you own that cost the least amount? The greatest amount?
2. What do we have in our classroom that cost the least amount? The greatest amount? (The teacher will proceed along this line with the school and the community.)

Session 3:

Objective: That the children gain awareness that regular saving is a problem among children in our school.

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Implementation: Simulation Game: in form of student survey.

Procedure: Assume: That the children arrive at the hypothesis that regular saving is a problem in our class and in other classes in the school.

Step 1: Divide the group into three sections of "reporters".

A. The first group will visit all elementary classes in an effort to find out how children spend allowances or earned money.

B. The second group will visit all elementary classes in an effort to find out how many children save part of allowances or earned money regularly with specific goals in mind.

C. The third group will survey its own class regarding spending and saving habits as stated in A and B.

Step 2: The three groups will meet together and report on their survey.

Activities: A chart may be made indicating (1) major areas for expenditures of allowances and earned money and numbers of children involved and (2) numbers of children involved in regular saving for specific goals.

Session 4:

Objective: That the students gain an awareness of why regular saving is a problem among the children in our school.

Implementation: Simulation game utilizing role-playing.

Procedure: Step 1 The teacher will choose two groups, designating one the ANTS and the other the GRASSHOPPERS. (Aesop fable familiar to children.)

Step 2 The teacher will ask the two groups to prepare and list their arguments for saving or for spending.

Step 3 Following the role-playing, a third group, designated as the PANEL OF JUDGES shall rule on the effectiveness of the arguments of the ANTS and the GRASSHOPPERS.

Activities: Playing the roles of ANTS, the savers, and the GRASSHOPPERS, the spenders, the two groups may act-out their arguments with puppets.

Session 5:

Objective: That the children gain an awareness of the means available for saving regularly.

Implementation: A trip will be made to the local bank and an interview arranged with the manager.

Procedure: The teacher will plan with the children for the trip.

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Activities: Through discussion a list will be made on chalkboard of type of behavior for a visit to bank, and questions to be asked of manager.

Some possible questions may be:

1. What ways are there that we may use to start a regular savings program?
2. What is a sensible amount for us to set aside for saving?
3. Can we have a savings program at school?

Session 6:

Objective: To initiate a savings program for students at school.

Implementation: Interview with Superintendent of Schools and class discussion.

Procedure: The teacher and a small group of children will visit the Superintendent to discuss the possibility of setting up a savings program in school.

Assuming permission is given, teacher will lead a general discussion on suggested activities for getting the savings program started.

Activities:
A. Teacher and children will decide type of savings to handle, except U.S. Gov. Savings Stamps and Bonds.
B. A day and time will be designated for Bank Day, except Tuesday 12:00 - 1:00.
C. Designation of most suitable location for setting up Savings Booth, except lower hall near office.
D. Decision to be made concerning types of records to be kept, except total savings, percentage of total elementary students involved in each class.
E. Choosing of committees to operate Savings Booth, keep records, etc.
F. Preparation of explanatory mimeographed letter to be taken by all students to parents.
G. Designing posters to advertise Savings Program.

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PAPER WASTE IN ELEMENTARY SCHOOLS

An environmental experience for a middle elementary math class.

Created By: Environmental Education Staff
Kenai Peninsula Borough School District
P.O. Box 1266
Soldotna, Alaska 99669

Generalization: Personal values and society influence environmental decisions.

Concepts: Waste paper
Recycling
Measuring Tool
Unit of Measure

Behavioral Objective: After a successful experience the student will be able to:

1. Given any box, determine using a measuring tool, the surface area and volume.
2. Determine using a measuring tool, the volume of paper collected daily from the 4th and 5th grade.
3. Using figures obtained in collection of paper waste, calculate the amount of paper waste by volume that is produced in one day in the school.
4. Critically discuss alternatives to accumulating this amount of paper waste.
5. Determine the amount in pounds of garbage produced each week at home.

Activities:

1. Obtain large boxes from janitor, using different measuring instruments such as: ruler, shoelace, belt, meter, inch, etc.
2. Collect waste from one room daily for one week. Determine volume.
3. Determine volume using figures for one room for entire school.
4. Interview janitor for information as to cost of disposing of waste, manner in which waste is gotten rid of.
5. Experiment with waste paper to see if alternate uses of waste can be developed. Examples: shredding for paper mache, pulping and compacting, etc. Rolling into fireplace logs, etc.
6. Write letter to Chambers of Commerce to determine whether there are any plants in Alaska that recycle paper products.
7. Have discussion to determine if there is anything that the students can do to cut down on waste paper. Is there anything the school as a unit can do to cut down on waste paper?

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LOOKING AT THE LAND

AN ENVIRONMENTAL EXPERIENCE FOR ELEMENTARY STUDENTS

CREATED BY: Carole Oien
Juneau, Alaska

GOAL: To help students become aware of land and land usage within walking distance of their school.

NOTE: This plan was designed for use at Gastineau Elementary School in Juneau, Alaska. The outdoor investigations are particularly applicable to the area surrounding the school and are presented here as developed and used by Mrs. Oien. Other teachers using this plan will have to adjust the activities to meet the limitations of their school's surrounding environment.

ACTIVITY DESIGN:

I. Walk To The Beach

a. Fasten a pedometer on a child as we start in order to get a more accurate idea of the distance from school to the picnic area.

b. Each child will be provided with a plastic bag to collect shells, driftwood, and other "found objects" to bring back to the classroom and save for plaster of Paris sand casting and a mobile, both to be made at a later time.

c. At the picnic area we will play a measuring game in order to develop the children's perception of shorter distances.

1. Each child will have made two small flags from popsicle sticks and construction paper before leaving the schoolroom.

2. The teacher will have measured out 200 feet of twine and with the aid of several children will stretch this out on the beach play area and fasten it with a noticeable marker at one end.

3. The children will then place their red marker flags in the sand alongside the twine at a point they judge to be 100 feet from the marker.

4. We will then measure off two feet intervals in the sand; let the children see if they can match their pace to this, then they will be allowed to pace off a 100 foot distance and place their blue marker flags.

5. Then several children will measure the distance using yardsticks. The class can then compare their estimates to the actual distance.

d. After a play period on the playground equipment, during which groups of children will be encouraged to observe the sand through hand lenses, we will go as a group to observe the sewage outfall that is very near. (This is assuming that there is a low enough tide

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otherwise this activity will be scrapped as being less important than having a good day for the field trip.)

e. The children will be encouraged to report any kinds of pollution including litter, carving of initials and other acts of vandalism, sewage pollution etc. that they observe during the course of the field trip. These will be listed on the board after returning to the room (then copied on chart paper by the teacher) along with their proposed solutions to the problems.

1. Any solutions we can act upon will be followed through, including, I hope

a. A clean up walk around the neighborhood and school yard.
b. Clean up and conservation posters in the business houses.
c. Clean up of the children's own yards at home.

II. Walks in the Woods Behind the School

A. As a lead in to this activity we will read and discuss the units in our science textbook (Today's Basic Science 3, published by Harper and Row) entitled "Plant and Animal Communities", and "Life in the Big Pond".

b. Other introductory material, including stories and articles from Ranger Rick magazine will be used.

c. The first woods walk will have as its main activity the examination of a square foot of ground by a pair of youngsters. Each pair will use a previously measured four foot length of yarn to mark their area and they will record on a piece of paper (backed by a workbook for a solid writing surface) each different object they find in their area. Hand lenses will be available for closer observations. The names of the plants, insects, rocks, man-made objects etc. are not important to the objectives of this activity---but the awareness of the many different objects in the small patch is. The children will be encouraged to observe differing areas, including muskeg, under logs, near a small pond, under a tree, in the open etc., and to share their discoveries with others after they have recorded them.

d. Other walks (or part of these may be done during the first one) will include these activities.

1. Observations in nature--questions asked in field, then in class

a. What do you see whose texture could be described as slick, hard, rough, soft, slimy, velvety, coarse, knobbed, furry, hairy, waxy etc.?

b. What do you see whose shape could be described as round, oblong, triangular, rectangular, pointed, curved etc.?

c. What do you see whose density could be described as solid, hollow, spongy, porous, non porous etc.?

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d. What do you see whose temperature could be described as hot, cold, clammy, cool, lukewarm, etc.?

e. What do you see whose size could be described as narrow, large, small, tall, short, thick, heavy, bulky, miniature, etc.?

f. Many of these words will be new to the youngsters and will be good additions to their descriptive vocabularies.

2. Describe the evergreen trees seen.

a. What kind of bark? Rough, smooth, very rough, etc.?

b. Are they generally symmetrical? If not, can you infer some of the reasons they are not?

c. What trees have droopy tops? Which ones regular shapes? Which have branches that curve up? Which branches that droop down?

d. Do they have needles or leaves?

e. Are the needles stiff or soft? Regular or irregular in length?

f. Are the needles placed on the bough completely around the stem or is the bough flat?

g. What kind of trees have needles placed in this way?

h. After several observations of this general nature and practice in the field each child will be asked to identify a spruce and a hemlock bough in the classroom.

i. If the leaves of the alders and willows are sufficiently developed we will attempt differentiation between these two species also.

III. Determination of Age of Trees

a. Look at the annual rings and count them on a stump on the slope behind the school.

b. Observe and count whorls of a spruce or hemlock tree. Each whorl stands for one year of growth. Add five years to the number of whorls, as it takes five years for the first whorl to develop.

IV. Bark Pattern Rubbings

a. Each child will be provided with a fat black or brown crayon and a thing piece of paper (such as ditto paper).

b. They will hold the paper firmly against the bark of a tree and rub the pattern.

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c. This will be done to several species of trees and then they will observe the differences.

d. Could you identify a tree by this means? Is each pattern distinctive?

V. Observing Wildflowers

a. Pick a few specimens of abundant species for classroom observations and beautification.

b. Color pictures from dittos prepared by the teacher with the natural color of the flower.

c. Draw any others that were observed and for which a ditto is not available.

d. Several books about wildflowers will be available for use by the children for identification and general interest.

VI. Observe Mushrooms and Other Fungi

a. What colors of mushrooms and other fungi do you see?

b. How do they feel to the touch? Do they all feel alike?

c. Where do fungi grow?

d. Are they plants, animals, or minerals?

e. Do they have seeds? How are new mushrooms grown?

f. Make spore prints.

Cut the top off a mushroom and place it with gills down on a sheet of paper. Cover it with a glass jar and let it sit overnight. Lift the jar and mushroom cap carefully. What makes the print on the paper? Spray it with lacquer and examine under a microscope and hand lens. This will be done with several different mushrooms and different shades of paper (light and dark).

VII. Observation of Berries

a. Do you know the name? If not, can you find it in a book in the classroom?

b. Is it edible? Is it poisonous?

c. What berry is poisonous? Can you describe it?

d. Color on a ditto baneberries in their natural color. Impress on the children that these berries are poisonous and should not be eaten.

VIII. Observation of Birds and Other Wildlife

a. Do you know its name? Can you find its picture in one of the books in the classroom?

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b. What kind of animal do you suppose made that track? What do you suppose it was doing here? What kind of food does it eat?

c. Do you suppose a lot more animals use these woods than we are able to see? Why do you suppose that is?

IX. Observation of Differences Between Plants, Animals, and Minerals

a. The teacher will identify objects as to these three categories when speaking with the children in the field and in the classroom.

b. The class will play the classification game of Plant, Animal, or Mineral (I Spy) at regular intervals.

c. The children will be encouraged to try to stump each other as to which of these three categories an object should be placed in.

X. Measuring

a. Have children determine the length of their hand in the classroom and use it as a readily available measuring device to determine such things as how far is it from the ground to the first branch of a tree, can you find a fallen branch one foot long? A bush three feet high? etc.

XI. Collect Objects for Art Projects (provide paper bags)

a. Cones

b. Weeds with intricate lacy patterns

c. Small natural objects for mobile and sand casting

d. Alaska cotton (for an early fall field trip), etc.

XII. Game for the Woods (to be on a ditto sheet and a copy distributed to each child--only two or three minutes should be allowed for this activity)

a. Read this sheet completely before starting.

b. Touch the spruce tree closest to you.

c. Touch the plant closest to the tree.

d. Walk around the alder tree closest to you.

e. Walk over to the nearest person and say hello.

f. Find a spruce cone and put it in your pocket.

g. Go to the nearest tree and wrap your arms around it.

h. Walk to the nearest person and shake hands.

i. Take the cone out of your pocket and bury it.

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j. Put this paper in your mouth, get down on all fours, and walk about ten feet.

k. Stand up straight and yell loudly, "I have followed all the directions so far." (Do this only if you are the first to get this far.)

l. After you have read this far, do only number 1 and number 13.

m. Walk around and act busy. Do not talk or laugh at anyone--let them be foolish in peace.

XIII. Walk to a Pond Behind the School

a. Observe what is around the pond. Could you tell you were approaching a pond? Are there different plants near the pond? Are there different animals?

b. Is the pond water clear? Do you suppose there is anything in the water to affect the clarity? What might there be?

c. Obtain several jars of water for observation in the classroom--both microscopic and macroscopic. Draw what you see through the microscope.

d. Pour some water through a clean white cloth and observe the stain left. What is it?

e. Differentiate between plant and animal matter seen in the microscope.

f. Make two gallon-jar aquariums.

1. One with a base of sand, and water directly from the pond. Water plants should be planted in the sand. If a stickleback can be obtained, and if the aquarium is fairly well balanced, it can be sealed and the fish observed to live for quite a period of time. (I have done this previously and it turned out quite well.)

2. One with water from the pond that has been boiled. The jar should be half full with grass and leaves obtained from a dried-up pond. Cover it with foil and put it in a well-lighted place. Examine water from various parts of the jar daily for three weeks. Note and record all changes. Why was the water boiled? Could we have used tap water? Why did we put in the grasses and leaves from a dried-up pond? Were they the origin of the cloudiness in the aquarium? What do you observe under the microscope that is present in the water? What do the organisms in the pond eat? Do some pond organisms make food? Which ones do this?

XIV. Walk Around the School Neighborhood

a. Observe present land usage of the developed and undeveloped areas and take notes and sketch on paper (with workbooks for support).

b. Return to the classroom and in committees make maps of the immediate area on butcher paper.

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c. As a group list the usage of the land and then categorize as residential, commercial, open space, recreational, service, etc. (Make a color key of these usages and use it on the maps.)

d. List on the board any changes the class would like to make in the way the land is being used--being sure to bring out the aesthetic value of less litter and the value of natural areas. (Lists can be copied on chart paper and preserved for referral during the rest of the unit.)

XV. Art Projects

a. Walk to the beach directly below the school and sketch. Provide charcoal sticks, paper, and workbooks for easels, also newspapers to sit on.
(This is a relatively undisturbed stretch of beach and it is quite picturesque with an old wharf, pilings, and the city of Juneau and Mts. Juneau and Roberts across the channel.)

b. Make a cone collage--tear off individual petals and arrange them on cardboard or construction paper using Elmer's glue.

c. Make a mobile using natural objects from the beach or woods. (Need a branch or small piece of driftwood, yarn or thread, and "found objects".)

d. Make sand castings in the classroom using plaster of Paris, boxes of sand collected at the beach and "found objects".

e. Spatter paint using a lacy patterned weed--need either a frame and screen and an old toothbrush and paint, or the easier way with a can of spray paint.

f. Sunlight designs--put leaves or other arrangements of foliage on colored construction paper and expose it to the sun for a few hours on the window sill. The children could also cut their name out of paper and place them on the picture.

XVI. Classroom Nature Happenings

a. Each child will gather a few rocks on the playground. He will put them into groups using his own criteria--such as size, shape, color, hardness, etc. Why did you use that difference?

b. Observe how the top surface of the leaves of the coleus plant on the back table moves toward the sun when the plant is turned by the teacher. Why?

c. The teacher will attach a few small pieces of paper to the coleus leaves with paper clips. What happens? Why?

d. Gather a pot of dirt from the woods. Keep it watered. Does anything sprout? What is it? Why did it grow there?

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e. Make a pendulum (Children or the teacher--could use the mechanism for the simple balance in the Science room)--label one Extreme Preservation and the other Over-Exploitation. It will swing back and forth and finally balance in the middle.

f. Discuss the ways a glass of orange juice, an egg, and a pencil get to your home.

XVII. Language Arts

a. After one of the above field trips the children and the teacher will complete a chart about their observations--classifying them as to which of the five senses was used.

b. Then we will list as many descriptive words as they can think of to accurately describe their observations. Was the forest still, hushed, dark, valuable, dependent, fascinating, etc.? Were the birds twittering, chattering, boisterous, noisy?

XVIII. Culminating Activities

a. Committees of children present their ideas for the development (or preservation) of the area that is currently undeveloped adjacent to the school.

b. Simulation Game

The children will pretend that ten houses, a shopping center, and a four lane highway are proposed for the undeveloped area near the school. The bulldozers and other equipment are approaching and the children of the school, the trees, the wildlife, and the earth (all of which can talk) are planning a protest. The children will role play the parts of the preservationists and the developers. After the role playing they will discuss which arguments the participants used were the most valid.

Revised by: Jo Michalski
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SKINS & SKULLS

AN ENVIRONMENTAL EXPERIENCE FOR ELEMENTARY STUDENTS

CREATED BY: Environmental Education Staff
Kenai Peninsula Borough School District
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Soldotna, Alaska 99669

Objectives:

A. Observation
B. Expression of an idea supported by a reason
C. Categorizing
D. Reasoning from a given set of information

Materials:

A. Skulls and skins from Fish & Wildlife Service
B. Worksheets and chart
C. Paste
D. Crayons

Method:

A. Skins - discussion of similarities and differences

1. color
2. Length of hair, texture
3. additional features--claws, whiskers, ears, tail
4. use of the above characteristics

B. Skulls - discussion of similarities and differences

1. shape and size
2. teeth
3. horns or other features
4. use of above

C. Worksheet and food chart used after students have concluded the use of sharp pointed teeth vs. flat teeth

1. Categorizing animals into larger than humans and smaller than human (no set right or wrongs depending on whether the child was considering a baby or adult animal).

2. Classifying animal by using food chart, as to needing pointed or flat teeth.

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RENNOVATING AN HISTORIC PARK

"OUR DYING PARK"

An Environmental Experience for Elementary Grades 3-6

Created By: Linda Calver
Box 165
Skagway, Alaska 99840

Goal: To help students become aware of the condition of our public park from our past generations. We want to help the students discover the things they must do to restore the park for our generations to come.

Note: This plan was designed for the restoration of the Molly Walsh Park in Skagway, Alaska.

Activity Design

SESSION 1:

Objective: To help the students learn the importance of asking well worded questions, which can help them find out more about the environment around them.

Activities:

A. Allow the students ten minutes to think of questions about the Molly Walsh Park. All the questions should be important to help them understand the parks history.

B. Write all the questions on the black board. This will give the students a chance to evaluate each others questions.

C. Have the students discuss each question very carefully. They must be sure each question contains important information about the parks history, as:

1. The parks age.
2. It's size, in relation to city blocks.
3. How the park got it's name.
4. If there are any future plans for the park.

D. After each question has been discussed as a group, the questions the students felt most important were made into a questionnaire. A copy of the questionnaire will be distributed to each student.

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SESSION 2:

Objective: To have all the questions on the questionnaire answered. By contact with public employees, use of public records, maps, etc.

Activities:

A. Walk to City Hall

B. Ask the city clerk the questions on the questionnaire, the questions are all about the Molly Walsh Park.

1. As she answers the questions the students will be ask to write the answers in the spaces provided on their sheets.
2. We may obtain permission to use city records through the city clerk.
3. The complete map of the City of Skagway showing all property lots and their owners my also be used to answer a few of their questions. This map may be used with the permission of the city clerk.
4. The city clerk may wish to direct us to an old pioneer of Skagway to complete any questions she was unable to answer for us.

SESSION 3:

Objective: That the students gain an awareness of what has happened to our environment in our short past, by discovering the true condition of our public park.

Activities:

A. Take a field trip to the Molly Walsh Park.

B. Have the students notice the location of the Park.

1. How many blocks from the business district is it?
2. Is the park located North, South, East, or West?
3. How many blocks from the residential area is it?

C. The students will be divided into groups of 4 students per group. The groups will measure the park.

1. Markers from each group will be put in each corner to help the students see the approximate size of the park. This will help them to equaluate the property as a whole.

D. The students will draw a simple map of the park on the back of their questionnaires.

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1. Label the map as N., S., E., or W.
2. Include a few surrounding buildings.
3. Label any existing plants, trees and etc. on your map of the park.

E. Each student is required to read the plaque on the statue of Molly Walsh. The students will take notes about anything they found interesting about her.
   1. Why she was important to the people of her time?
   2. How she may have effected their environment?
   3. What year (years) she was important?
   4. If they (the students) throught she was important enough to name the park after her.

F. The students in each group will examine the area and the condition of the land thoroughly.
   1. Each group will take a sample of the soil back to school with them.
   2. Test will be made on the soil samples.
      a. To determin what minerals it contains at present.
      b. What minerals we will have to replace in the soil.
   3. It should also be determined from our soil testing the different fertilizers we may need to use to replace minerals lost from the past.

SESSION 4:

Objective: To find out the different improvments the students as individuals would like to make to build the Molly Walsh Park into the perfect park.

Activities:

A. After returning to school, our class will discuss the improvements they feel should be made.
   1. Clearing out the brush.
   2. Putting in new equipment.
   3. Restoring the minerals in the soil.
   4. Purchasing garbage cans.
   5. Planting grass and flowers.

B. Discuss the different kinds of playground equipment at the part the day of our field trip.
   1. Broken swing
   2. Cracked wadding pond.
   3. Broken Benches.

C. Have them discuss the kinds of playground equipment they would like to have in the park.
   1. New swings and baby swings.
   2. We need more equipment the pre school children can play on.
   3. Tables.
   4. Benches.

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5. Sandbox
6. Equipment the children can bounch on.

D. The students will now draw a map of their ideal park. They may have anything in their park that will make it an ideal park for them. Each thing in the map must be labeled, as the grass, swings, sandbox, etc. Each piece of equipment must be put in the exact spot on the map as they would have it in their park.

SESSION 5:

Objective: The students will discuss and decide on the kinds of projects they want to do to raise money for the restoration of the Molly Walsh Park. During the winter we well not be able to work on the park other than raising money for it.

Activities:

A. Cleaning in front of business buildings before we get a lot of snow.

B. Keeping the sidewalks clear from snow.
   1. Individuals homes.
   2. Business Buildings.
   3. Public Buildings.
      a. Post Office
      b. Bank.

C. Cake walks after school. Each child in the room will bring a cake.

D. Writing letters to the businesses in town explaining what we are doing and to see if they might like to help by giving a small donation for the park.

E. Writing to the private clubs in town explaining what we are doing and perhaps they would like to make a donation. We would also, ask for any volunteered help in the spring to help us clean up the park. If any of their members would like to volunteer we will be more than pleased to hear from them.
   1. B.P.O. Elks
   2. F.O. Eagles
   3. Emblem Club
   4. Others

F. To see if we could get the Art & Crafts Club to donate a a sign telling the names of everyone who helped to restore and bring back to life the Molly Walsh Park.

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"THE CREATION AND RE-CREATION OF A CITY"

An Environmental Experience for Elementary Grades 3-6

CREATED BY: Jackie Jansen
Box 184
Skagway, Alaska 99840

GOAL: To help students become aware of the development of a city. To demonstrate the need for the improvement and maintenance of their own city.

SPECIFIC GOAL: To help students become aware of the condition of our Public Parks. We want to help the students discover the things they must do to restore the park for our generations to come.

NOTE: The community plan was designed for the restoration of the Molly Walsh Park in Skagway, Alaska. The beginning activities are intended to give the students background information and experiences that will enhance their understanding of their own community and its development.

ACTIVITY DESIGN: Simulation Game

Session 1: The Settlement of an Uncharted Island

The students will be shown a transparency projection of a map of an island. This particular island is well endowed with various geographical zones. The teacher will point out on the map the various geographical areas and characteristics of the island. They include:

1. Swampy region
2. Mountainous region
3. Desert area
4. Riverbeds
5. Rolling hills region
6. Timber land or forest areas

The students will then be divided into groups of four. They will then discuss among their group members and come up with answers to the following types of questions: You are a group of settlers. Why did you come to this island? What were some of the reasons you moved from your former home? Where do you plan to settle on the island? Why? What type of economy will you have? Where will you get the necessities of life---food, clothes (if you need them), water, etc.? What type of shelters will you have? What type of transportation will you need, if any? Assuming that the other groups settled on this island in the other three corners---How will you treat your neighbors? Will you communicate with them? Trade with them? How will you decide on the borderlines or boundaries? Give your settlement a name.

The students will be asked to draw a picture portraying life in their settlement, some of the buildings, the type of work they will be doing, if any, how they will organize their city, etc. The members of each group will be asked to choose a method of presentation of the information about their particular group settlement. After all groups have made their presentations, skits, or speeches or whatever other method they decide upon, each student will be asked to decide which city he would rather live in and give his reasons briefly. The teacher will record the number of votes each group gets and will give the results after all students have given their choices.

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Session 2: The Makings of an "Ideal" City

The students will be introduced to the prospect of making a display of their conception of an "ideal" city. The teacher will explain that the type of display that she had considered would entail much work but would be as much fun as putting together model cars, airplanes or puzzles. All students would be responsible for creating at least one building for their city and more than likely would be building two. We can use wood, cardboard, or whatever type of media they decide upon, but first we must plan our "ideal city". The students will be given several minutes to think about the type of city they would most like to live in. What types of buildings will they need in their city? What the location of their city is--near a river?--in a desert?--in the mountains? etc. What types of businesses they think they want. What will you do for recreation? After they have thought about their "ideal city" the teacher will begin writing down their suggestions for their city. A good place to begin might be with the types of buildings they want. Perhaps a brief discussion about the above questions will help to get things going. When the board is full or the chidren are running out of ideas, the teacher will help the students divide this list of ideas into categories of buildings or city sections. The teacher will ask the students to look over the list of suggestions and ask them if there are any that anyone would NOT like to see in their "ideal city". If there is opposition to a particular building or idea, a discussion between those opposed and those in favor will ensue. When both sides have had a chance to give their opinions the class will vote on the matter. The majority, of course, wins. The development of this "ideal city" is a year's project in itself and would take up too much of this paper to explain thoroughly. Rather I would like to discuss the community plans that deal with only one area of the development of this city--Recreation. First of all I will list a few of the projects that have been planned to further the students background information about the development of an "ideal city"; this is done mostly by getting to know their own community better. Following are some of the activities used to do this:

1. Field trips to places of business in town.
2. Trip to City Hall, Fire Station, Post Office to discover their function and importance.
3. Guest speakers from the community to speak about their jobs, skills, etc.
4. Research projects dealing with the buildings that the student chose to build. Must find out why needed, how constructed, best design, etc.

There are several other activities that could be listed but let us now assume that the students have researched, planned, and constructed a model of their "ideal city". It is time to compare the city in which they live with their "ideal city". One of the areas of comparison will be as previously stated, recreation. The children will become involved in a discussion that will hopefully lead to the present recreational facility in Skagway for children---Molly Walsh Park.

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MAINTAINING THE SCHOOL COMMONS - SIMULATION

A SIMULATION GAME ADAPTABLE FOR GRADES 1-8

CREATED BY: Environmental Staff
Kenai Peninsula Borough School District
P.O. Box 1266
Soldotna, Alaska 99669

Purposes:

1. To demonstrate the relation of pollution to numbers (population)
2. To emphasize the cumulative effect of individual decisions
3. To stress individual responsibility

Problem:

Who should be responsible for maintaining school commons?

Roles:

Students represent the total student body, act as the teacher, janitor, and school secretary.

Factors Assigned to Each Role:

Students follow directions, but otherwise mimic a particular person of that role as closely as they can.

Conditions for Players:

Remain quiet and observe so as to be able to follow directions and not interfere with the game.

DEFACING SCHOOL PROPERTY

I. One student is the teacher; the others' role--play a series of students who use the classroom over an 8-period day.

   A. Each student doodles on his place at the table during a one-minute period while the teacher tries to teach.

   B. Students leave the room and return as for second period, repeating A.

   C. This is repeated eight times. At the end of the period the students observe the cumulative effect on the tables.

   D. At the end of the simulated day, the teacher begins to clean the tables as rapidly as possible. The students predict how long it will take for the teacher to clean the table. As the teacher cleans, the students write a paragragh telling how they imagine the teacher feels.

   E. Follow with discussion.

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Discussion idea:

1. How did the pretend teacher feel?

2. How would a real teacher feel?

3. How much time would it take the teacher to clean tables if she did it 180 school days?

4. Why do teachers get upset about defacing?

5. How does the number who participated in defacing complicate the problem?

KEEPING TRACK OF PERSONAL POSSESSIONS

II. One student is the teacher, one is assigned to be the school secretary for the next day, the rest will be students.

A. Start with a neat clean room. One at a time, have each student in the class leave a belonging in the room. (Leave in sight)

B. Students watch the cumulative effect. The teacher collects the articles and puts them in a box.

C. After students leave the room to go to the next class, the teacher is told to distribute the articles to their owners before the next day. She will keep track of the time it takes to identify owners and find them.

D. Those articles the teacher cannot place will go to "Lost & Found." The school secretary, played by a student, proceeds the next day to help students recover their articles. She keeps track of the time she spends.

E. Secretary and teacher report to the class telling the difficulties they had returning the items and how long it took.

F. Follow with discussion.

LITTERING

III. One student is the janitor, the rest represent the student body.

A. As students walk one at a time up the hallway, they leave a piece of litter on the floor.

B. When students get to the other end, they turn to watch the cumulative effect. When all students have passed, the janitor picks up the litter while the students time the procedure.

C. Follow with discussion.

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GARBAGE DISPOSAL SIMULATION

A Simulation Game for 4th Grade Social Studies

Created By: Environmental Education Staff
Kenai Peninsula Borough School District
P.O. Box 1266
Soldotna, Alaska 99669

Concepts to be Developed: Land Ethic
Environmental Quality
Environmental Decisions

Statement of Problem: Garbage disposal location has been closed by state officials. Garbage must now be hauled to nearest approved site 35 miles away or disposed of individually, which may create more harm in the long run.

The state says it is not their responsibility to provide this service; as does the borough assembly.

Groups Represented:

1. Individuals and Businesses - This group represents people and businesses forced to find new locations for garbage disposal or haul their garbage to an approved site.

2. State Health Officials - This agency is responsible for public safety regarding disposal of solid wastes, public water supplies, and protection of future population.

3. Private Property Owners - This group feels they have the right to do as they please with their land regardless what would be best for the community.

4. Citizens for New Dump - This group of people feels the need for an adequate disposal facility, but does not own any site suitable and does not want to run a private facility.

5. Borough Assembly - The group must decide whether garbage disposal is a problem that should be dealt with and make recommendations to the state, or provide this service itself.

Influencing Factors

1. People are reluctant to drive 35 miles to dispose of their solid waste.
2. Most people own their own land and feel what they do with it is their own business.
3. The state has no department set up or funds available to manage any disposal site in local communities.

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4. Boroughs of the type in existence in this area are not empowered to this type of work.
5. The community is not an organized city with taxing authority to construct an adequate land fill.
6. No single person has the desire to construct a private land fill.

Procedures - Divide the class into various groups. Each group should meet and discuss what it wants the borough assembly to do about the problem. The ideas should be based on research into the problem--not just personal opinion. Each group should elect a spokesman and present its case to the borough assembly.

The assembly should elect one of its members to be in charge of the meeting. After listening to the representatives from different organizations, the borough assembly should come up with a list of priorities--things that can be done to help aleviate the problem.

Each group will have 15 minutes to present their case.

After Conclusion of Experience -

1. Did each group base their presentation of actual facts of the group they represented?

2. Is the problem discussed a serious problem in your community?

3. What else could be done to further this cause?

4. What other choices are available to the decision making body?

5. Do you feel differently now to this problem than you did before the exercise? How?

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SIMULATION: BURNING OF MATERIALS FROM WASTE BASKETS

A simulation exercise for a 3rd grade class.

Created By: Environmental Education Staff
Kenai Peninsula Borough School District
P.O. Box 1266
Soldotna, Alaska 99669

I. Statement of The Issue: Each day the custodians at the Soldotna Primary School burn the paper from the waste baskets. In some towns this is against the law; but, so far, it is a legal practice in Soldotna.

Across the nation, most towns have made opern burning against the law because it adds to air pollution. We don't want industry to pollute our air, but is it alright if each of us pollute the air, though?

The people that run the school and the custodians think this practice is OK since it is cheaper than hauling the paper to a solitary land fill and less trouble than trying to recycle it.

II. Groups With an Interest in the Burning of the Trash

1. Custodians - Like burning the trash because it's so easy. They also say it is cheaper than hauling it to the dump. It saves time and money.
2. Women in Neighborhood - They don't like the trash burner because the smoke and ashes blow on their houses and make their clothes dirty when hanging on the line to dry.
3. Company that Sells Recycled Paper - These people feel paper products are too valuable to burn. If the paper is collected and sent to the factory, they can make new paper from it. This causes less air pollution, allows more trees to grow, and is cheaper.
4. Government - The local government wants to do the best thing and operate as cheaply as possible. A little air pollution won't do any damage and the presystem of burning is cheap.

III. Factors Affecting the Decision

1. Cost - The cost can not be much higher than the present system--something that cost more might be better, but we can't afford it.
2. Air Pollution - As long as the situation doesn't get any worse, we can put up with it.
3. Attitudes - The decision of what to do must make the angry women in the neighborhood feel better about the issue.

IV. Possible Decisions

1. Pass a law which makes it illegal to burn waste paper products. They must be recycled.

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2. Pass a law that makes it illegal to burn paper products without a device to clean the air before it comes out the chimney into the atmosphere.
3. Allow the practice to continue as it is presently being done.

V. Procedures

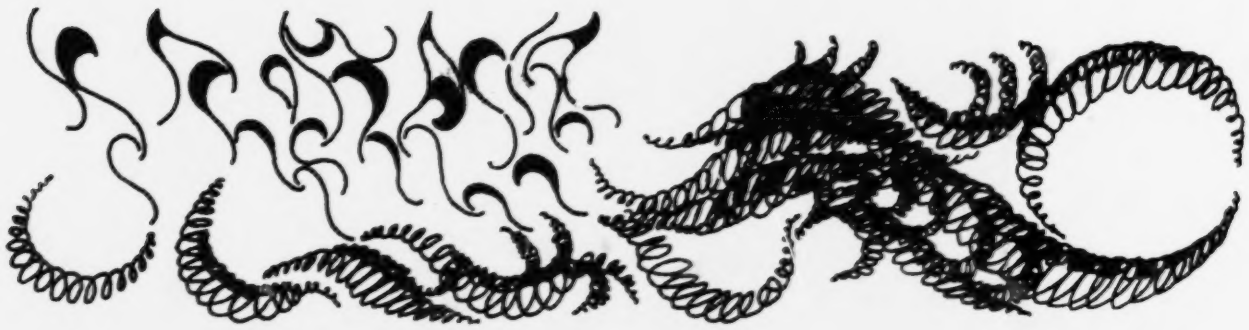
1. Roles - The class will be evenly divided into the four interest groups and one decision making body.

2. Presentation - Each group will have 15 minutes to review and discuss the role to be played. During this time the decision making body will be developing guidelines upon which to base a decision. Each group will have 10 minutes to present their point of view.

3. Rebuttal - After each group has presented their materials, there will be a 10 minute recess for each group to prepare questions to ask the other groups. There will then be a 20 minute rebuttal (5 minutes per group).

4. Decision - The decision making body will have 10 minutes to question the groups after the rebuttal. Then there will be a 10 minute recess during which the decision will be made.

The decision should be presented to the school administration.



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TASK ASSIGNMENTS FOR ENVIRONMENTAL INVESTIGATIONS IN CONSUMER PACKAGING

I. OBSERVING AND COLLECTING DATA ABOUT CONSUMER PACKAGING

Task A (1-1 1/2 hours) Work in groups of 3-5

Identify as many different types of packaging material as you can find on supermarket shelves.

Estimate the weight of one type of packaging material and predict the amount that would be carried from this store in a complete turnover of stock.

List any alternatives you can for present packaging system.

Identify the packaging materials that might be recycled.

II. INTERPRETING DATA ABOUT CONSUMER PACKAGING

Task B (15-30 minutes) Work in groups of 3-5

Prepare the data you have collected in such a way that others may interpret and understand your finding.

III. COMMUNICATING FEELINGS, AWARENESS AND VALUES ABOUT CONSUMER PACKAGING

Task C (15-20 minutes) Work by yourself

Identify in writing the packaging materials you feel were not necessary for protection of goods.

Describe in writing how you feel about consumer packaging.

Describe in writing at least one action you might take in your everyday life to reduce consumer packaging waste.

a. in your home

b. in your profession or business

c. in your community

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SAMPLE LESSON OUTLINE AND QUESTIONING STRATEGY FOR CONSUMER PACKAGING INVESTIGATION

I. Questions and Discussion for use after observing and collecting data about Consumer Packaging

What did notice about the Packaging materials?

What types of Packaging materials were used most frequently?

Why is packaging material used?

What alternatives did your group decide were possible?

How can we summarize the information?

II. Questions and Discussion for use after interpreting data about consumer packaging

Did you notice any Similarities in the charts?

Did you notice any Differences in the charts?

(list on chart Differences and Similarities)

What were the general ideas expressed by all the charts?

III. Questions and Discussion for use after Communicating feeling awareness and values about Consumer Packaging

(record actions to be taken)

Ask group to share feelings about Packaging

Summary Questions

What did you discover about Consumer Packaging?

(record information)

Why should this be a concern?

What can we as a community or society do about this Problem?

Have you made a committment to do something about consumer packaging?

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CONSUMER PACKAGING INVESTIGATION

BEHAVIORAL OUTCOMES IN KNOWLEDGE

As a result of these activities you should be able to:

Identify various types of packing materials sold to consumers.

Construct a recording device to interpret data about packaging materials.

Demonstrate the ability to establish alternatives for waste caused by excess packaging.

Demonstrate the ability to estimate the weight of a specific type of packaging material.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES AND ACTION

As a result of these activities you should be able to:

Describe in writing how you feel about the necessity of excess packaging materials.

Describe your feelings about consumer packaging.

Describe one action you might take to reduce packaging waste in your home, business or profession and community.

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HOME ECOLOGY: A CURRICULUM PLAN FOR HOME ECONOMICS STUDENTS

An Environmental Experience for Secondary Students

Created By: Karen Ryals
R.R. #5, Box 5389
Juneau, Alaska

Goal: The goal of this experience is to enable students to react with increased awareness to the people and their problems with the world in which they live. Concern and demonstrated action are components of this goal.

Activity Design:

The Content Outline of this unit is below and the suggested tasks and activities should be included through-out the discussion of content.

I. The People Problem.
   A. What is it?
   B. Quantity or Quality of man's life on earth.
   C. What is it doing to the environment?

II. Relating the population explosion to the Juneau area.
   A. Our rapid growth, what problems has it created.
   B. What are local residents doing to help these problems be solved.
   C. What are individuals doing to improve the situation.

III. The family and home in relationship to the environment.
   A. Family size and the future.
   B. Consumerism and Americans.
   C. Waste products of a family.

IV. Home Ecology
   A. The Kitchen.
      1. Foods
      2. Soap and Detergents
      3. Electricity
   B. The Bathroom
      1. Water
      2. Sewage
   C. The Bedroom
      1. Birth Control
      2. Clothing Selection
   D. Garage
      1. Cars and Pollution
      2. Recycling Storage
   E. The Garden
      1. Plants for Food
      2. Natural Insect Control
      3. Compost

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Task A

Identify the problem of disposal of wastes around your own home. What can we do to reduce it? What is this waste doing to your environment?

Task B

Have students choose an area of town. Distribute large garbage sacks and have them spend one hour collecting anything that looks like trash that is spoiling the environment. Bring this back to school.

Task C

Student reports...Where did you go? What did you find mostly? How could it have been more effectively taken care of? Why was it left there and what might prevent its being just left there? Etc.

Task D

Have students sort their findings into groups of bio-degradable and non-bio-degradable. Of the non-bio-degradable, which can be recycled? Wash it and prepare it for recycling, or if it is not of appropriate quantity, bundle it into a bag.

Task E

Construct and evaluate a plan to prevent non-selective consumerism that results in large amounts of non-bio-degradable and non-recyclable garbage.

Additional Ideas

* Invite a sanitation engineer to discuss sanitary landfills with the class. Visit a sanitary landfill and note the content of the fill.

* An Agricultural Extension Agent can instruct students on how to build a compost heap and what type of garden grows well here.

* Have a representative from Sears demonstrate one of their garbage compactors. Discuss the good and bad effects of such a machine.

* Local League of Women Voters members can offer good information on legislation concerning unit pricing and packaging.

* Do a study of packaging in a local super-market.

* Have students learn to make soap, jam, pickles, candles, etc. from parents or grandparents and then have them teach other members of the class. Discuss the value of creating these items vs. buying them. Would it be good or bad if all households went back to being as self-sufficient as possible? What environmental, economic, social effects could this type of move have?

Revised by:: Jo Michalski Environmental Education Technician
Alaska State Department of Education

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THE COST OF CLEAN-UP-AN ENVIRONMENTAL EXPERIENCE FOR BUSINESS EDUCATION

An Environmental Experience for Secondary Students

Created by: Lillie Mae Mattila
Box 1084
Sitka, Alaska

Goals: The goal of this activity is for the student participants to discover the costs involved in cleaning up our environment and at the same time to develop business skills by dealing with a real and relevant problem.

Activity Design:

Task A

Have students select a public area of their community that needs to be cleared of debris, could be developed into a park, etc. (Every community has at least one such area and most have quite a few!)

Task B

Students should then organice themselves into data-gathering groups of 4-5 members each and estimate the labor, equipment, rental and supervision costs involved in rennovating the area decided upon in Task A.

Task C

Students will develop a plan of action for determining actual costs of the clean-up and carry through this plan by contacting citizens in the community for cost data (city engineers, state engineers, truck drivers, etc.). This information will be recorded in a double-entry book-keeping journal, using a cash payments journal and a payroll register. Payroll taxes--Federal and State income taxes--FICA (social security)--will be declucted from the wages. Each group should attempt to secure as much donated help as possible and must prepare two "Estimates of Cost" - one that includes as much donated work as possible and a second one which details all expenses that would have to be met without donated help.

Task D

The "Estimates of Cost" financial statements can now be submitted to the City Council with a strong recommendation that the action be taken. Students may also wish to submit an article to the local newspaper and do a community survey to determine the extent of community support for their plan.

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Note: This is a superis plan for getting students involved in community action and will generate much classroom discussion. Mrs. Mattila's comments on her classes response are below.

The plan met with enthusiastic approval from the class. Students divided into groups to secure the information. The were unable to get the services of the city engineer, thus relied on the abilities of two highway employees: John Edwards and Ed Mattila. These men estimated the time required to clean the area was approximately one week. They also suggested two dump trucks and two drivers in order to utilize the maximum use of the dozer. (one truck will load while the other one unloads.) Attached is a copy of equipment rates the students secured from the State. The union wage scale is used by the city.

After discussing the high wage scale with the group, several boys decided they would not mind working at a laborer's scale since the pay is $7.00 an hour. This created much discussion, for it was pointed out that the labor market is usually flooded with prospective employees, and construction is usually seasonal. As a result, two members of the class are checking with the Department of Labor regarding work opportunities in Alaska and the type of jobs that are most needed. The students enjoyed this work and did not find it difficult. In fact, they asked if they could do some more work like this. When I asked, "Why?" they replied that it was easy.

All projects were completed on schedule and the students met their objectives. The students were able to relate their hypothetical salary (equipment operator, etc.) to life situation. For example, some were surprised to learn the amount of taxes withheld were quite high, but they never questioned this same problem when studied from the text.

We also submitted this information to the city with a recommendation for the area to be cleaned up.

*Included with this plan is one set of cost estimates.

Revised by: Jo Michalski
Environmental Education
Technician
Alaska State Department of
Education

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COMPUTATIONS

State of Alaska, Department of Highways--Equipment Rental Rates for Equipment used for force account as payment for work performed.

EQUIPMENT RATES

Dump truck	$12.50/hr
Loader	18.50/hr
Cat--Dozer, D7	17.00/hr

Taken from Contractor's weekly payrolls for union scale for classified labor work.

LABOR RATES

Foreman	$11.51/hr
Dozer Operator	10.18/hr
Loader Operator	10.45/hr
Truck Driver	8.26/hr
Laborer	7.05/hr

Equipment rental rates include fuel, oil, grease, etc. for equipment during the work being performed. Those rates are established as a cooperative effort between State and the Contractor.

PAYROLL REGISTER

For the Week Beginning March 6 and Ending March 10, 1972 Paid March 15, 1972

EMPLOYEE DATA				HOURS	EARNINGS			DEDUCTIONS					NET PAY	
No.	Name	Marital Status	No. of Exemptions		Regular	Overtime	Total	Withholding	FICA	Insurance	State Other Income	Total	Amount	Check No.
1	Foreman	M	3	40	460 00		460 00	42 50	23 94		2.55	68 99	391 01	1
2	Dozer Operator	M	5	40	407 20		407 20	21 60	21 17		1.30	44 07	363 13	2
3	Loader Operator	M	4	40	439 00		439 00	40 20	22 57		6.43	69 20	364 80	3
4	Truck Driver #1	M	6	40	330 40		330 40	26 00	17 71		4.16	47 87	282 53	4
5	Truck Driver #2	M	4	40	330 40		330 40	33 00	17 71		5.28	55 99	274 41	5
6	Laborer	M	5	40	282 00		282 00	12 00	14 66		1.92	28 58	253 42	6
					2244 00		2244 00	175 30	117 76		21.64	314 70	1929 30	

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JOURNAL Page

ACCOUNTS PAYABLE DEBIT	GENERAL LEDGER DEBIT	DATE	ACCOUNT TITLE AND EXPLANATION	POST. REF.	GENERAL LEDGER CREDIT	ACCOUNTS RECEIVABLE - CREDIT
	2244 00	1972 March 15	Salaries expense	519		
			FICA Taxes Payable		117 76	
			Income Tax Payable		175 30	
			State Unc. Inf Payable		21 64	
			Salaries Payable		1929 30	
			March 10 payroll			
	1000 00	15	Equipment Rental Expense			
	460 00		Dump truck (2)			
	680 00		Loader			
			Dozer			
			Equipment Payable		2340 00	
			March 10 Rental			
	178 35	15	Payroll Taxes Expense			
			FICA Taxes Payable		117 76	
			State unemployment Taxes		60 59	
			Employees taxes payroll			

CASH PAYMENTS JOURNAL Page

DATE	ACCOUNT DEBITED	EXPLANATION	CHECK NO.	POST. REF.	GENERAL LEDGER DEBIT	ACCOUNTS PAYABLE DEBIT	PURCHASES DISCOUNT CREDIT	NET CASH CREDIT
1972 March 15	Salaries Payable	March 10 payroll	1-6	101	1929 30			1929 30
15	Equipment Payable	March 10 payroll	7	101	2340 00			2340 00

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CLEANING DEBRIS 1/2 MILE JAMESTOWN BAY

Expense Statement

March 15, 1972

Equipment Rental	$2340.00	
Salaries Expense	2244.00	
Payroll Taxes	178.35	
Total		$4762.35

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SNOW-MACHINES AND THE NATURAL ENVIRONMENT

An Environmental Experience for: Secondary Mechanics Class

Created by: Keith V. Joslen
Star Rt. C. Box 61
Mile 95, Glenn Highway
Palmer, Alaska 99645

Goal: The goal of this three-week study is to create in each student a desire to become better acquainted with snow machines. The entire class should be motivated towards a greater understanding of snow machines, the kinds and types, principles of operation, repair and maintenance and the effect of snow machines on our natural environment here in Alaska and in other areas of our state and country.

Activity Design:

I. Snow Machine Observation (to become acquainted with various brands, styles, sizes, etc. of snow machines)

Task A

1. Break class into small groups of students.
2. Go through snow machine magazines and have students list all the different brands they can find.
3. List all brands on blackboard.

Task B

1. Have each student choose a brand from the list on the board and write down 3 or 4 characteristics that he can observe about that brand just by looking at the picture. The student groups should be small enough to allow each student to select a different brand.
2. Rotate pictures within the groups, each student writing down 3-4 additional characteristics for each brand.
3. Rotate pictures until each student has added observable characteristics.
4. Each student should end up with his picture & the list of characteristics he began with.

Task C

1. Each student should read through his list of observations.
2. As a group make a list of how all the machines are similar and how they are different.
3. Make a third list giving any particular features that one machine has or has not in comparison to the other machines.

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Task D

1. Work between groups and have one or more members of each group give the characteristics of his machine until members of another group can guess what brand it is.

Task E

1. Have each student write the name of his machine on the black board and list 2 or 3 reasons why he believes this would be a good machine. Also list 2 or 3 reasons why you think it would not be a good one.

Task F

1. At this point have each student write down which machine he would like to have on the basis of what they've discovered in Tasks A-E.

II. Questions For Discussion (small groups or entire class)

1. Do you know more about some machines than you did before?
2. What other factors would be important in determining whether or not a machine is a good one?
3. Are there other things you would like to know about snow machines? What?
4. Are there other activities we could do to learn more about snow machines? What would you like to do? What do you believe you can do?
5. What other things could you do on your own to learn more about snow machines?
6. Snow machines are a part of our mechanized Environment. Are there any good or bad effects of the machine on our natural environment? What?

III. Studying the Relationship Between Mechanized Environments and Natural Environments

Task A (Form Provided)

1. Instructions to students: Divide into small groups and using Task A, form a list of the various vehicles you can think of that have had a negative influence on our environment. What is the problem? What caused it? What effects has it had? What are possible remedies for the problem?

Task B

1. Take a field trip into local natural area for observation of environmental damage by snow machines. Discuss what to look for before leaving and have students record their findings.

Task C (Form Provided)

1. Take a field trip to a snow-machine shop to interview workers. Also interview local citizens to determine their attitudes about snow machines.

Task D (Form Provided)

1. Discussion and written work concerning snow machines and their effect on the natural environment.

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FORM A

	Vehicle	Problem	Cause	Effect	Remedy
1.					
2.					
3.					
4.					
5.					
6.					
7.					

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Task B - Observation of Snow Machine Trails

1. Hike over last winters snow machine trails
2. Observe damage to trees, limbs, etc.
3. Record damage and the extent of it.

4. Discuss what could have been done to prevent this damage.

5. What can we do to prevent further damage?

Task C - Trip to Snow Machine Shop and Interviewing local residents

1. Make up interview questions before leaving

2. Decide what student is to ask what question.
3. Record answers and pertinent information on separate sheet.
4. Study and discuss answers and information obtained.
5. Were there agreements? Were there disagreements?

6. Do you agree? Why or why not?

Task D Form: Individual and Group Study

1. Write out all other areas of our natural enviroment effected by snow machines. List problems caused and how you believe these problems can be dealt with. - do individually

2. As groups, compare and discuss assignment.

3. Discuss ideas for prevention, solutions and controls of these problems.

4. Discuss actions the students might take to improve the relationship between the mechanized vehicles and the natural environment within their own community.

Revised by: Jo Michalski Environmental Education Technician
Alaska State Department of Education

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EVOLUTION

AN ENVIRONMENTAL EXPERIENCE FOR 10TH GRADE BIOLOGY

CREATED BY: Environmental Education Staff
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Behavioral Objectives:

At the completion of this lesson each student should be able to:

1. Discuss critically and identify adaptations of two lab specimens to their natural environment.
2. Verbally compare and contrast at least two environmental changes that have taken place historically and two that are occurring today.
3. After choosing two animals that have become extinct, propose reasons for their becoming extinct and be able to defend them.
4. After becoming informed of one environmental change occurring presently:
   a. identify the cause of this change.
   b. state and evaluate alternative solutions.
   c. develop a plan of action.
   d. implement a plan of action.

Activities:

A. Through observation, compare and contrast any two lab specimens noting how each animal is designed to function in a particular environment.

B. Discussion - Environmental Changes - Discuss changes that have occurred in the past. What changes are occurring today?

C. Construct - an animal of your choice by drawing or sculpturing. Then create in writing a hypothetical environment for this animal (trade animals and see what type of environment your classmates construct for this animal based on its adaptations)

D. Symbolize in a drawing with a caption your predictions concerning man's future in this changing environment.

INTERPRETATION OF DATA

Facts:

1. Open - What are some of the things you noticed in doing the activities the last two days?

Specific Concepts:

2. Focus
   a. What did you find out about animals in your lab work?
   b. What environmental changes did you mention?

Interrelationships

3. Interpretive
   a. What relationships exist between animals and the area in which they live?
   b. How does a change in the environment affect the animals living there?
   c. What effect does man have on changes occurring in the environment?

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Generalizing - Integrating All Information

4. Capstone
   a. How could you sum up this discussion?
   b. How could you integrate this information into a general statement or two?

Task A

Choose three animals from the laboratory specimens. Designate in writing all the characteristics that enable each animal to function adequately in its natural environment.

Example

A	B	C

Task B

Using your text as a basic resource, describe two changes that occurred historically and briefly describe their significance.

A.

B.

Identify two changes in the environment that are presently occurring and predict what results these changes may possibly bring.

A.

B.

Task C

Construct a hypothetical animal having adaptations to live in a particular environment. Write the characteristics of the environment on the back of the page. Have a classmate determine the characteristics of the environment by observing the adaptations of your animal.

Drawing Environment

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Task D

As a class:

1. Identify one issue which represents a change in the environment which may be harmful to the welfare of humans.

2. Gather all the information you can concerning this issue.

3. Determine alternative solutions which may alleviate this problem and evaluate the alternatives.

4. Develop a plan concerning what could be done.

5. Implement your plan.

Task E

Symbolize your concept of adaptation in a drawing representing man 100 years from now. Be able to defend your ideas.

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SAVING HISTORICAL SITES

AN ENVIRONMENTAL EXPERIENCE FOR A JR. HIGH SOCIAL STUDIES CLASS

CREATED BY: Environmental Education Staff
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Generalizations (s): Historical sites generally depict an important event in a country's past.

Concepts: Historical Sites
Events
Past

Data: To be compiled by students through appropriate activities.

Behavioral Objectives: At the successful completion of this environmental experience, each student will be able to:

1. Identify and briefly verbalize on the historical significance of three historical sites in the general area.
2. Identify a structure or area of land that represents a historical event that has not had any steps taken to preserve its significance.
3. Draw a scale map of the area which represents land ownership and access to the historical site.
4. Develop alternative plans how this site could best be utilized to convey its historical importance.
5. Evaluate alternative plans and develop a plan of action to preserve the historical site.

Activities:

Tour - Take a trip to some historical site in the area. Discuss the historical significance of the site and why it has been preserved. Discuss the steps necessary to have the site set aside. Discuss other sites than the one which was toured.

Mapping - Choose a historically important structure or area of land near your community. Measure the tract of land involved and develop a scale map of the site. Develop a legend for the map.

Planning - After mapping the area, present alternative views on how the land can best be utilized to show its historical importance. Discuss pros and cons of each plan. Interview members of the community to determine their feelings concerning the project.

Action - After evaluating alternative plans, develop a plan of action. Present plan of action to Chamber of Commerce, Historical Society, City Fathers, etc. Obtain support for the project from as many diversified groups as possible. Make sure the general public is knowledgeable concerning the specifics of the project.
Labor, equipment, materials, etc. can often be obtained with very little invested if the community supports the project.

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LAND-USE PLANNING: AN HISTORICAL COMPARISON BETWEEN GREEK CITY STATES AND ALASKAN COMMUNITY

An Environmental Experience for Secondary Students

Created by: Anthony E. Reiger
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Juneau, Alaska 99801

Goals: This activity was designed for use in comparing Juneau, Alaska to the Greek City States. It can be used however as basis for creating comparisons for your own community.

The goal of this study is to enhance the student's appreciation of the importance of the environment in shaping economic and social development. Students should discover the importance of land use planning past and present and the resultant alternatives to poor land-use planning. This experience should enhance the student's knowledge of:

a. the development of Ancient Greek City States
b. the expansion of Greek colonization
c. the birth of a Greek middle-class
d. the growth of Greek democracy
e. their Community - past and present planning potential

Activity Design:

Task A Give the class the assignment of taking a map of their community and ask them to design an ideal but practical, well-balanced community plan. They are the first humans in the area. On-site explication and analysis is a very important part of this task.

Task B: Compare student plans with the existing land use and property distribution. Discuss the differences in the ideal and real from the standpoint of vested interests, traditional power structures, and existing development.

Task C: By utilizing lecture and discussion point out the following main themes concerning ancient Greece.

To be dealt with in sequence: GREECE

a. the similarity of the geography of that area and Juneau.

b. the then existing absolute control of good land in the hands of a very few.

c. the lack of opportunity to effect change by those except the rich minority.

d. the frustration over lack of change, and the opportunity for input in the majority, especially the young.

e. the resulting coloni movement out of the city-states to start new settlements.

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f. the resultant development of a trading, shipping, merchant middle-class.

g. the resultant demand of the new middle-class for political rights equal to the nobles.

h. the resultant movement toward broader political freedom and citizen input in government.

Task D: By taking the opportunities the ancient Greeks struggled to obtain centuries ago of a democratic process and the availability of citizen input in our modern day situation, have the class take a second look at Juneau's present land use problems and formulate specific changes and specific plans of implementation. The class can profit from the past in appreciating their opportunity to enhance the quality of their lives and retard the drain of Juneau's coloni.

Task E: Evaluation Instruments and Procedures

Suggested Options:

a. a variety of short tests over discussed data.

b. a paper outlining major comparison themes between ancient Greece and our area.

c. a paper discussing specific land use problems in Juneau and suggested remedial approaches.

d. recording student participation in local government policy decisions which were initiated by this activity.

Revised by: Jo Michalski
Environmental Education Technician
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ENVIRONMENTAL GEOMETRY

AN ENVIRONMENTAL EXPERIENCE FOR SECONDARY STUDENTS

CREATED BY: PATRICIA BICKAR
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Goal: The goal of this project is to have geometry students realize that geometric designs are in use all around them and are not just found in textbooks and on exams. A further goal is to have students come to some conclusions as to why particular shapes were used and how their function determines their environment.

Activity Design:

Task A

Class discussion to decide what types of geometric shapes to look for in their environment and some examples of each. (Round, Rectangle, Squares, Trapezoid, Triangle, Hexagon, Parallel lines, Diamond shape, Pentagon, Octagon, Globe-spheres, Parallel piped, Perpendiculars, Pyramids, Cones.)

Task B

Class divides into groups and is sent out for a specified period of time to discover examples of geometry in their environment.

Task C

Class members report their observations to other members of the class and discuss why particular shapes were found in certain places and what the uses might be.

Task D

Interviewing specialists in the community that use geometry in their line of work.

Task E

Summarizing information gathered and discussing the activity and it's merits.

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Mrs. Bickar's Comments:

We first discussed the possibilities in class. Had they ever thought about the things they saw every day in the light of it being a geometric shape? Why do you suppose it had that shape? The students were more than enthusiastic about a field trip to see which group could return with the longest list.

It was a little hard to find a day when we could go out. Weather has not been just the best for trudging around Sitka. But by putting on boots and scarves, etc. we faced a snowstorm and took off. Both classes were divided into two groups with an aide taking one and my going with the other---and heading in opposite directions from our school. They were to meet back at the building inside forty-five minutes with their lists of everything that they could see. And how those lists grew. Some took a pretty good stretch of the imagination---and lots of repetition---but they opened their eyes and saw things.

Bolts are not round on the heads but they have hexagon,---or pentagons, etc. for shape so they will give grip to wrenches. Swing sets are set up with triangular supports so they will stand the hard use, in fact, triangles were discovered all over town giving strength to things that no one had even thought of before - garden gates, wire supporting telephone poles, screen door corners, etc. Heavy machinery such as cranes, etc. were a series of triangles - amazing! Most objects looked better if they were more rectangle - seemed to have better proportions. Signs - especially traffic signs had a great many shapes and come to think of it - when they took driving tests the difference in signs was important. Honeycombs were geometric - six sides fit together perfectly. When you put five sided figures together they curve around. And since it was snowing - snowflakes were discussed, but the snow was not of the kind where you could look at individual flakes - too bad. Picket fences are parallel to each other. Here the artist came to light, and haunted houses vs. neat little cottages were discussed. Would a painting of a haunted house be true to form if the picket fence had nice parallel pickets around the house, or would the neat little cottage be neat if the pickets weren't nice and perpendicular. Would a garden gate look realistic in a painting if it was rectangular with no triangular support or would the public just have a feeling that something was wrong with it, even if they couldn't really put their finger on it. These are just a few of the comments that came up during the walks and in class discussion afterwards.

Following the group field trip, the ditto sheet was handed out and the students were asked to do a little outside work. About half the class turned in results of their interviews this last week. Several have asked for extensions of time for various reasons. One wrote to her uncle who is a designer of airplanes, one is waiting on someone to come back to town to complete construction on the bridge - weather has held this up for over a month longer than expected, etc.

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Some of the interviews made have been with:

A logger who described the filing of the teeth of the chain for his power saw, the angle that a tree has to be cut so that it will fall properly, etc.

A carpenter - who uses the level, square, framing square, tri-square, and tape. Angles necessary to find pitch of roof, put in cove-molding, plan for board feet necessary for building.

An engineer at the mill who emphasized how much math, geometry and trigonometry are all used in the planning of the building design and in the technical part of the work at the mill. Areas, volume, etc. used daily.

A boatbuilder who pointed out the triangular shape of the bow - for strength, speed, etc. The balance must be figured - weight, volume, etc.

A fisherman who navigates by geometric principles, the geometric shapes of the fishing gear. The triangular shape of the support poles.

A gardener measures area of lawn to plant seed, fertilizer needed. The shapes of flower beds which are circular, rectangular, triangular - not just because they fit a certain spot but for appearance.

A heavy duty mechanic discussed the build of his machinery. That lifting power was more when done at straight lift than at an angle which would throw off balance - figuring center of gravity. Triangular shapes used to strengthen machinery.

Electronics described the wave lengths formed by nature and how man has capitalized on them with math to bring us a picture on T.V.

Coastguard ship uses triangulation for plotting their distances, for plotting their own course and for establishing the position of landmarks and other ships. Found all sorts of unusual shapes on the ship - with round windows, etc.

A heavy-duty equipment worker discussed the construction of his backhoe. The shape of his teeth, the volume of the bucket, etc.

As you can see, this project was received with more enthusiam and even though it is officially over I have several that are working on some aspect of it just because they have become interested.

(As an unexpected bonus to our field trip we found a grate to the heating unit from my classroom which some vandal had removed and discarded in a square cement drainage pile that a group of the boys were investigating for possible shapes for their report. It was retrieved and is back in place in my room.

I was quite satisfied with the results of this experiment and feel that the students involved will be just a bit more observant about the world around them - not just in the line of geometry but just seeing the world with their eyes open - and not always just accepting it because it is there.

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Your name:

Name of person interviewed:

Occupation and who and where he works:

If the interview was at the place of work, what did you observe that was geometric in shape? Did its shape serve a purpose because of the job it was performing, or why did it have that particular shape (for beauty, more economical in that shape, strength, for other functional use). (Use the back of the paper if not enough room here.)

If you were not on the job but just talking to someone: Are geometric objects used, i.e. for equipment, for decoration, etc.? Do they use the mathematics of geometry to solve problems in their work such as areas, volumes, length of distances by using similar triangles, etc? (Use back of paper of additional sheets if this room is not enough. Do not limit yourself to questions on this paper if you think of others.)

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WILDLIFE MANAGEMENT

An Environmental Experience for a Science Class

Created By: Environmental Education Staff
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Generalizations: Game animals are generally controlled naturally or by regulations imposed by man.

Concepts: Game Animals
Natural Control
Regulations
Man

Data: To be collected by students through appropriate activities.

Behavioral Objectives: At the successful completion of this environmental experience each student will be able to:

1. Identify pressure groups that influence regulations.
2. After reviewing past and present regulations and their effects, formulate a set of regulations of his own.
3. Predict possible changes that may be necessary in the future.

Activities:

1. Interview various people and determine sentiment toward wildlife. See if bias exists in groups of similar individuals. Identify those groups that violate regulations most frequently.
2. Review regulations related to wildlife inquestion. Collect all possible data related to population and harvest. Evaluate regulations and their effectiveness.
3. Integrating previously discussed materials, develop a set of regulations based on any recommendations that may be advantageous to wildlife management practices. Have a wildlife biologist and protection officer come to class and discuss new policy.

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FLOOD PLAIN RECOGNITION

An Environmental Experience for a High School Earth Science Class

Created By: Environmental Education Staff
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Soldotna, Alaska 99669

Generalization: Individuals should become aware of resource issues, their associated problems, and management techniques affecting their outcome.

Concepts: Resources
Resource Problems
Management Techniques
Individuals Role

Behavioral Objectives: After the successful completion of this experience the student will be able to:

1. Recognize a flood plain by observing physical properties of any given river.
2. Given a map showing the Kenai River shade in the flood zones from the Soldotna Bridge to the mouth of the River.
3. Identify and record type and abundance of vegetation in the flood plain of the Kenai River from Soldotna Bridge to mouth of River.
4. Predict what would happen showing the results on a scale map of the lower end of Kenai River if the water level in the river permanently raised two feet.
5. Write a flood plain ordinance to be presented at Borough Assembly meeting.

Activities:

1. Take a tour along Kenai River from Soldotna to mouth of River.
2. Identify stream development according to maturity.
3. Construct chart to show:
   a. rapids
   b. braiding
   c. meandering
   d. oxbowing
   e. sloughing
   f. tributaries
   g. stream load
   h. gradient
   i. discharge
4. Construct display of material forming soil of flood plain by taking at three levels and a one mile interval along tour route.
5. On USGS topographic map note development of natural levees, terraces, and incised or entrenched meanders.
6. Record type of vegetation next to stream bank: at 100 ft. and 300 ft. at one mile intervals along tour route.
7. Contact Borough officials to determine what flood plain regulations are presently in force.
8. Construct a chart showing flood damage over the last 20 years.
9. Using data obtained to write an ordinance concerning flood plain land use and present it to Borough Assembly.

Equipment:

USGS maps of area, clipboards, soil bore, plant identification book, camera, borough ordinances.

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MAN'S WELL-BEING IS DEPENDENT UPON THE STATE OF HIS ENVIRONMENT - A PHOTO EXPERIENCE

An Environmental Experience for: Secondary Students

Created By: Thomas L. Johnson
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Palmer, Alaska

Goal: The goal of this exercise is to acquaint students with the skills involved in photo journalism and to better enable them to see the dependency of man upon his environment. This exercise was developed for photo-journalism students but with modifications could be adjusted to fit any subject area.

Activity Design:

Task A

1. Distribute copies of Life picture stories to students for examination.

2. Discussion following these lines:
   What is the purpose of the article?
   How do the pictures help accomplish the purpose?
   Why are these pictures effective?

3. Students will be given the task of locating another photo story from a recent magazine and criticizing it in front of the class.

Task B

1. Assignment will be given to prepare a photo story on the theme, "Man's Well-Being Is Dependent Upon the State of His Environment" as this theme is revealed in their own community.

2. Students may work in pairs and should be given sufficient time to allow for a search of appropriate subject matter, developing and printing of their pictures, writing copy, and preparing their lay-out.

Task C

1. All photo stories will be discussed in class and selected photo stories may be displayed in a school show-case, printed in the school or community newspapers and displayed around the community in various places.

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2. Discussion Questions:

What is the message?
What is accomplished by the photos?
How could the photos be improved?
Are the layout and copy effective in conveying the message?
Is the message of the particular story important to the general theme?
What relationship has been shown between our community and the state of our environment?
How can photo journalism be used to educate and persuade others with regard to our existing environmental conditions?

More Photo Ideas:

* Ask students to show evidence of "change in their environment" through photographs.

* "Take a series of pictures that tell a mystery story...make sure the pictures contain clues about how the story turns out."

What some kids have done:

- photographed vandalism in several steps
- created and photographed a melodrama
- photographed evidences of environmental degradation caused by man
- etc.

* "Take a picture of something you really dislike in the classroom or school environment...and see what you can do to change it."

What they photograph:

- teacher
- principal
- math room
- gym
- detention hall
- books

* Use the above idea with:

- the community
- the state
- the country
- try themselves

Revised by: Jo Michalski
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WHERE DO WE PUT ALL THE PEOPLE?: A POPULATION SIMULATION FOR SECONDARY STUDENTS

An Environmental Experience for Secondary Students

Created By: Jo Michalski, Alaska Department of Education, Juneau, Alaska 99801

Goals: To create an awareness of the problem of population distribution in the United States and the variety of potential solutions to this problem. This activity also allows students to practice environmental decision making, data gathering and idea presentation. . .all necessary skills in coping with present/future problems.

Activity Design: Divide Students into small groups and distribute task sheets.

TASK A: Allow students enough time to complete group discussion on graph information. Discuss and share ideas developed in each group.

TASK B: Working by themselves, students should read the short article "Where Do We Put All the People?" and then move on to Task C. Before moving on you may want to discuss the article briefly.

TASK C: Working with their group, students should complete Task C. You might want to discuss possible "places" to use for the two blank spaces with the entire group. Possible responses might be "stay in the city" or "create communities in previously uninhabitable areas (deserts, etc.)". You may want to eliminate these extra suggestions completely and stick with just the four suggested.

TASK D: Allow students to divide into groups representing the four given options plus any other populat options. You may allow anywhere from 30 minutes to a few days for development of group presentations. The more time allowed, the more sophisticated the presentation. Encourage students to use visuals and involve as many group members as possible.in their presentations. If more time can be allowed for data gathering suggest the use of surveys and interviews in addition to written resource materials.

FUTURE CITIZENS DECISION-MAKING BOARD

This board can be composed in different ways. If you want to keep the entire activity confined to just your students then the board could be composed of one representative from each population distribution grouping. If this is the method you choose, make sure the board members are given time to meet together to determine what criteria will be considered when listening to presentations and coming to a decision of the two best places to encourage future citizens to live. Otherwise, the board can be another class of students, a group of community citizens (make your presentations before your local Chamber of Commerce!) or any combination of students, teachers, parents that might be interested.

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TASK B: Read the following article by yourself.

"Where Do We Put All the People?"

The population of the United States is growing rapidly. Mr. Jerome Pickard has looked ahead to 1980 and predicts that the East Coast Megalopolis will contain 106 million people, the California region between San Francisco and Los Angeles will contain 28 million people and that there will be 9 million people in the Florida area. Where can we possibly put all these people?

Most of the population growth in the United States over the next 20 years will take place in the country's large urban areas--the megalopolis. Somehow we have to plan ahead for all the extra people.

The biggest problem posed by the 50 million new Americans expected by 1995 will be to find places for them to live without increasing the decay of our big cities and without polluting our environment. Some people have suggested that we try to attract people to secondary growth centers (smaller cities that have populations of 50,000 to 250,000) and also develop some way of encouraging people who now live in small towns and rural areas to stay where they are. More and more people are leaving the smaller cities, towns and rural areas and moving to the already big cities. This growth of our big cities is posing an array of difficult problems. The most serious problem is the split between the urban and suburban areas of a large city. The central city is decaying and is surrounded by diffuse suburban development accessible only by private automobile. Racial minorities have become isolated in the central cities and as industries move to the suburbs these people are losing their jobs. The economy of the central city is in big trouble while the suburban area is facing equally difficult (if different) problems of how to provide services for the new people and industries moving to their area. The threat to the eco-system is apparent---housing developments, highways, sewage,

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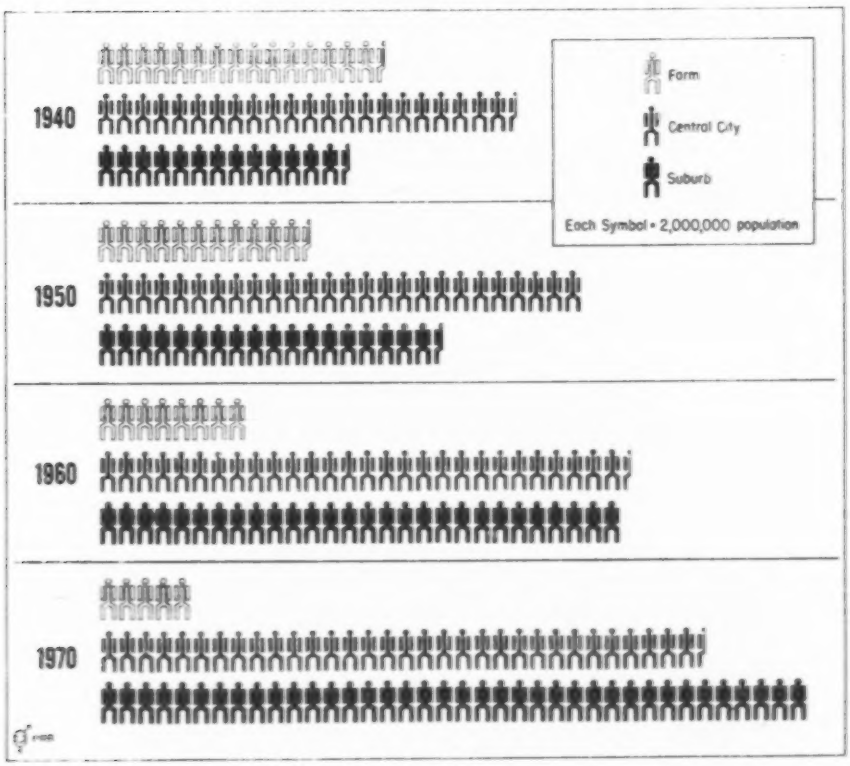
WHERE DO WE PUT ALL THE PEOPLE?

TASK A: Discuss with your group: How has the population distribution of the United States changed since 1940? What reasons can you give for these changes? Jot down your reasons below.

FARM, CITY AND SUBURBAN POPULATION, 1940-1970



Sources: U.S. Department of Commerce, Bureau of the Census, *Census Population and Housing: 1970. General Demographic Trends for Metropolitan Areas 1960-1970, Final Report PHC (2)-1 United States* (Washington, D. C.: Government Printing Office, 1971).

Share it: discuss your ideas with other groups.

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TASK E: The meeting of the Future Citizens Decison-Making Board should be called to order and the chairman of the Future Citizens should explain the reason for the meeting ("to determine the two best places for future citizens to live so that the problems of our over-crowded cities won't worsen, etc.") and then each group can be called upon to present their proposal. Determine a time limit for presentations and stick to it.

Concluding the Activity

When presentations have all been made, allow the Future Citizens Decision Making Board to come to a decision as to which two places they would encourage other future citizens to populate. After their decision is announced allow them time to explain their reasons for their choices, problems they may have encountered in coming to a decision, what they have learned about decision making from this activity, etc. Possible discussion questions for use with the whole group are suggested below:

A Few Discussion Questions (not in any particular order)

1. Were the presentations environmentally sound? Were they realistic?

2. What types of things should be considered when making presentations before decision making boards?

3. Do you feel that you are now better able to make a presentation before a real decision making board (city council, legislature, etc.)?

4. What can be done by the government to solve future population distribution problems? How can we solve the problem of our currently over-burdened big cities?

5. What can students do to help solve population problems? can you have any effect on the movement of people in your state?

Etc. Etc. Etc.

This game can lead to further discussion and investigation of population-control (birth control, family planning, etc.) urban problems associated with over population (crime, poverty, unemployment, environmental damage, etc.). Students might also be interested in discussing and investigating the future. Thus, this activity does not have to end after the final discussion but can be a jumping off point for discussions and investigations on a variety of related topics.

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trash disposal are all present threats to our environment if not handled properly.

What we need are some answers to the question, " Where do we put all the people?" We need to look at all the alternative distribution patterns for future U.S. populations and the feasibility of each. We need to educate our population and upgrade our smaller cities and rural areas to make them appealing to future Americans. (Adapted from "The Next 50 Million Americans", Population Education Newsletter, Vol. I, No. I for use with this activity.)

TASK C: Think about it (work with your group).

There are several alternative distribution patterns for future U.S. populations. In the spaces below list the advantages and disadvantages to encouraging people to move:

BACK TO THE COUNTRY

TO SMALL CITIES

TO SECONDARY GROWTH CENTERS

TO NEW TOWNS

List two more places where people could be encouraged to move and consider the advantages and disadvantages of your suggestions.

1. _____:

2. _____:

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TASK D: Divide into groups to represent each option for population distribution. Your task is to develop a 5 minute presentation which will be made to a group representing citizens of the future. These citizens of the future will then be able to choose the two best methods of population distribution. Consider the following questions related to your group's distribution category. They will help you in planning your presentation. Your presentations must be made by more than one person from your group and must include at least one visual aid.

BACK TO THE COUNTRY GROUP

1. The trend is now to move away from the country. How will you stimulate a reverse trend back to the country?

2. What role would rapid travel, inexpensive radio, teletype and closed circuit television play?

3. Are our communications and data transfer systems developed highly enough to handle a widely dispersed working force?

4. What are the economic advantages of city-centered industry?

5. Could industry be dispersed to the countryside?

SMALL CITIES GROUP (5,000-50,000 population)

1. How could small cities be connected to major markets?

2. What social problems are not likely to be so acute as they are in heavily urbanized areas?

3. Do our small cities have the capacity to absorb 10 or 25% of the 50 Million?

SECONDARY GROWTH CENTERS (50,000-250,000 population)

1. What methods could be used to attract more of the population to these cities?

2. What programs could be initiated to prevent the problems existing in the big city areas from developing in the secondary growth centers?

NEW TOWNS GROUP

1. What is the social appeal of pl ed communities?

2. Where does the money come from to build and maintain them?

3. Should these new towns be required to meet criteria of balanced land use, income distribution and racial integration?

4. On what basis should the location of new towns be decided?

TASK E: Presentations to the Future Citizen's Decision Making Board and decision from this board.

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A SIMULATION GAME INVOLVING COMMUNITY DEVELOPMENT

Created By: Susannah Walters
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Introduction: The problem involves setting up a community for a population of about 400 people who live in a community that must be relocated. In order to use this in conjunction with a planned trip to Katmai National Monument, the hypothetical situation involves a modern-day village of Katmai which will be destroyed because the nearby volcano is predicted to explode in one year. Thus, the members of this community must design their future town.

Step 1: Individually list some possible development that could be included in the new town site. These suggestions may or may not include present uses. Specifically: What do you want in your new town? What do you want that you don't have now? What do you want to eliminate or prevent?

Questions and Discussion

Step 2: List the possible types of development (which will probably include industry, housing, civil services, recreation, etc.). I will encourage the children to list specific things.

Step 3: Categorize the above items. First designate uses by letters, then give the categories a label.

Developing and Giving Presentations

Step 4: Divide the class (randomly) into the number of categories they have decided upon. Supposedly, this town will be dominated by one concern (such as industry, civil services, recreation) and each group must represent their area.

Step 5: Each group will start to list and analyze different ways of setting up their ideal community according to their purpose.

Step 6: Develop a presentation to be made to the Borough Assembly in one week. Each group will propose how to develop the new townsite, including where to put it.

A. Data Collecting - Interview local people who are involved with something similar to what you want to set up. Use library sources as well as personal experiences, etc.

B. Method of Presentation - You must use some sort of visual display. This may include slides, pictures, film strips, diagrams, as well as tapes of interviews, etc. Each group will be given 10 minutes in front of the Borough Assembly, more than one member must participate.

This step will take one week. After one day, one person from each group will be selected to make up the Borough Assembly. They will decide how they will choose the best plan.

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Borough Assembly

1. Decide how they wish to organize themselves.
2. Develop criteria to use in judging the proposals based on the needs of the people.
3. Visit and interview local Assemblymen with the purpose of finding out more about borough government and decision making.

Step 7: Borough Assembly Meeting:

Set up a mock meeting with the Assemblymen at the front of the room. After the presentations the Assembly will have about 30 minutes to decide on the best proposal and develop their reasoning for the decision.

Step 8: Each group lists criteria they think should be used in the decision.

Step 9: Assembly announces their decision. All the groups reasoning is compared and discussed.

Step 10: Evaluation

1. Do you think the board made a just decision? Why or why not? What problems might they have had in coming to the right conclusion?

2. What additional data did you group need? Did your group have adequate organization? What could you have done to improve your presentation?

3. How can you apply this to your own community?

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ALASKA HUNTING LAWS - AN ENVIRONMENTAL SIMULATION GAME

An Environmental Experience for Secondary Students

Created by: David B. Savage
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Goal: The goal of this experience is to acquaint students with the variety of possible solutions to an environmental issue and to give them practice in using communication and decision-making tools.

Activity Design

Problem or Issue: "Should Alaska become a No Hunting or a Closely regulated hunting area with enforced game laws?"

Identification of Groups:

1. Sportsmen who believe in game laws and their enforcement.
2. Dedicated conservationists who desire to see a growth of wildlife with a No Hunting law.
3. Those who want a completely open hunting situation with no laws.
4. Etc.

Possible Arguments:

1. Limited Bag laws tailored to game surveys
2. Stricter penalties for violators.
3. Game control through studies by biology and game experts.
4. No hunting with game control by natural processes of selection (i.e. survival of the fit, etc.)
5. Extinction of species by hunters
6. Pressures on game laws by political influence and self-acclaimed wild life experts.

Task A:

Explain the Problem or Issue to the class and have them determine the different interest groups that would develop in an issue of this sort. The 3 groups identified should emerge and possibly additional groups.

Task B:

Discuss the variety of arguments that each group might use in supporting their Yes or No stand on hunting laws.

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Task C:

Poll the class to determine those with preferences or fixed convictions and then divide the class into the groups decided upon in Task A (You may want to allow them to take a side they agree with or to deliberately assign them to defend a position they disagree with to enable them to see the oppositions point of view. If this is their first simulation-game it might be best to allow them to represent those opinions that they agree with.). Explain that this will be a role-playing experience, that they will be allowed time to collect data, develop their argument and that this argument will be presented before a decision-making board.

Task D:

Allow enough time for groups to determine their strategy and seek data. Sources of meaningful data might include:

1. Alaska Fish & Game Offices
2. Parents
3. Neighborhood Survey & Questionnaire
4. Library

Make available film projectors, overhead projectors, chart paper, colored markers, etc. for use in presentations. Encourage students to seek out or create visuals for use in their presentation. Require all students to take part in their group's presentation.

Task E:

When the student groups are approximately 1/2 way finished with Task D require each group to select one of their members to serve on the decision-making board. The decision-making board must then meet and determine the criteria by which they will judge the impending presentations. It will be up to them to evaluate all presentations and make a supportable conclusion to the hunting law controversy.

Task F:

The decision-making board calls the meeting to order and each group presents its findings with the hopes of persuading the decision-making board to conclude in their favor.

Task G:

The decision-making Board presents their decision; class discussion on the decision - its content and how it was arrived at.

NOTE: This is a sketchy outline of a simulation game and additional tasks, information to students and ideas should be inserted by individual teachers using this idea. This is however, an excellent vehicle for involving students in data gathering, communication and decision-making. Additional issues that might be used with this simulation format include polar bear and walrus hunting, unrestricted fish netting, out-of-state game licenses, controlled moose harvests, the musk-ox question, the snow-mobile and its impact on game conservation

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and ground growth restriction, timbering restrictions in Alaska and numerous questions on the various impacts of the Alaska Pipeline on Alaska Fish & Game. The possibilities for variations are unlimited in this environmental simulation game.

Revised by: Jo Michalski
Environmental Education Technician
Alaska State Department of Education

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ENVIRONMENTAL SOUNDS

An Environmental Experience for All Grade Levels

Created by: Jo Michalski
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Goal: To develop an awareness of the variety of sounds in the students's environment.

Activity Design:

1. Without moving any part of your body, make a sound. Can you do it? Now try it by moving some part of your body. List all the ways you can make a sound just by using your body. Here are some examples:

   a. Snap fingers
   b. Clap hands
   c. Cough

   * Which sounds on your list happen inside the body?
   * Which sounds happen outside the body?
   * Can other people hear all the sounds you listed?
   * What moved when you made each sound?
   * How did the sound get from its source to your ears?
   * How did it get to other people's ears?

2. Pick up a piece of paper. Time yourself. In one minute's time, make as many different sounds as you can using only that piece of paper and your body.

   a. List all the ways you did it. Here are some examples.

      1. Blowing on it.
      2. Hitting it with your finger.
      3. Whistling over the edge.
      4. Crumbling it into a ball.

   b. Compare lists with other students.

3. Take a rubber band. Time yourself. In one minute's time, make as many different sounds as you can using the rubber band and anything else at your desk.

   a. Make a list of all the different things you did to produce a sound. Here are some examples.

      1. Snap it.
      2. Snap it against the desk.
      3. Snap it over the book.
      4. Stretch it and flick it.

   b. Compare lists with other students.

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4. Now using only your lungs, your throat, your tongue and your mouth and lips make as many different sounds as possible in one minute.

   a. List all the things you did to make a sound. Here are some examples.

      1. Grunt
      2. Whistle
      3. Push air against the lips
      4. Clicked tongue

   b. Now compare the four lists you made. Group and label the different ways you made sound.

   c. Compare your classifications with those of other students.

   d. How did you label the "whistle"?

   e. Did you group "tongue clicking" with "rubber band snapping"? Why?

   f. What about "coughing" and "crumbling the paper into a ball"?

   g. Were any of the sounds pleasant? Were any unpleasant?

5. Divide into small groups (4-5 students each) and discuss the following questions:

   1. What are the pleasant sounds you hear inside your house?
   2. What sounds are unpleasant?
   3. What are the pleasant sounds you hear outside? What sounds are unpleasant?
   4. Why are some sounds considered to be music or pleasant to hear and other sounds are regarded as noise pollution?

6. Assignment: Go home tonight after school and pick out a place in your house to sit. Stay there for five minutes and listen to all the sounds you hear. List all the sounds you hear. Then go outside and find a place to sit. Stay there for five minutes and list all the sounds you hear there.

7. Divide into the same small groups and share the sounds you heard and listed during your five minutes inside and five minutes outside. Decide whether the sounds were pleasant or unpleasant. Did you hear any new sounds that your group didn't think of during the #5 task?

8. Give each group a tape-recorder and this assignment: "Develop a five minute presentation of sounds that makes a statement about our environment. Include as many sounds as you like." Allow enough time for students to decide what sounds to record; record these sounds and develop their "statement".

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9. Have each group present their "environmental sound statement" to the rest of the class. After each "statement" allow the class to discuss what they heard. Does everybody agree on what the "statement" says about our environment of sounds?

10. Have these same groups develop five minutes of "music" using sounds from their environment; present and discuss the sound "music".

11. Discussion:

    * What effect do sounds have on people?

    * What can students do to make our environmental sounds more like "music"?

    * What can the city, businesses, industries, etc., do?

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MATHEMATICS and the STUDY of the ENVIRONMENT (K-12)

A VARIETY OF ENVIRONMENTAL EXPERIENCES USING MATH

Created by: Don Greenberg
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Activities:

1. A visit to the cemetery will help bring out many family, social historical interesting comments of students. From earliest years of identifying the written numbers on the gravestones (maybe by pencil or crayon rubbings) to figuring out the ages of the people buried in a given grave and on to calculating the average age of the people buried in the cemetery or noting the percentage (or fraction or ratio etc.) of people born (or died) during a given time span to that of another or the total, students could be profitable engaged. A couple of specific questions that students could answer that might bring out other or lead to other researches might include: What is the average age of the people who died during the 19th century? During what years were the most (percentage) people buried? What is the average weight of gravestone of people who were buried during the years 1920-1930? How does this compare with the average weight of gravestones marking those buried between 1950 and 1960? What proportion of the dead were between 0 and 10, 10-20,...., 90-100, over 100 years old?

2. Traffic survey work also can engage children of many ages and mathematics depth. For younger children the counting of cars passing a certain point on a street or the number of parked cars on a given street would be a good exercise. Estimating numbers from a quick survey or from a prior expectations leads to many interesting activities. Figuring the percentage of cars parked in public, private lots or on the street begins to get more interesting especially if the average number of passengers is observed or estimated to then calculate the number of people working in the city requiring transportation. The distance (average) that various employees have to walk to their jobs from their parked cars leads to figuring percentage numbers of people working in various businesses and professions. Such a survey could easily lead to the feasibility of mass transportation for the area. Development of algebraic formulas such as the highway department uses for cars entering and leaving intersections is within the observational ability of school children, many different ages being able to assist in the counting. From these ideas one can be lead to figuring the probability that a given car entering an intersection might turn right, turn left, or go straight.

3. Land use is an excellent study for students of all ages. Beginning with simple enumeration of the numbers of a given type of use (for example, houses) in a given area, students can get into more complex issues. A few places where mathematics ideas can

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be helpful are implicite in 1 and 2 above, namely, how much land is used for a cemetery? What is the average amount of land area per buried person? How could the land (how much specifically) now used for parking be used if cars were not allowed in the city? Especially, how much land would become available if an area-wide mass transit system were instituted? What is the average amount of land required for car parking? How much land (area) is blacktopped? How many potential parking spaces are there in the Subport area if that region were utilized efficiently? How much does the dirt taken out of the ground for one burial plot weigh? Note the estimation possibilities for each of these measurements.

4. Motion is always a motivator. What is the average speed of cars on a given street? Compare the average speed of cars on (a highway) with those on Main Street, etc. With some simple assumptions calculate the acceleration (or the deceleration) of cars from various stop signs or red lights. Comparisons of the last could prove interesting. Estimate and measure the speed of various boats in the channel. What is the speed of floatplanes as they take off (or land)? What is the velocity of planes passing overhead?

5. Mapping, measuring distances by pacing (and other ways), doing geometric and trigonometric exercises in figuring heights and lengths, are so well known that I won't elaborate more on these unless requested.

6. Also well known and used to some extent would be stream flow velocity and volume with the amount compared with water amount used by people in the city. Quantifying the necessary ingredients for life in water, in the soil, and for plants. Although some qualitative, descriptive work is done with the factors effecting, for example, tree growth, what quantities of the various ingredients are necessary for how much growth of a tree? Some examples: How much nitrogen is necessary for a tree to grow three inches in a year? How many kilocalories of sunlight is necessary? For how many minutes would direct sun be necessary for such growth? What volume of water is moved into and out of the channel during the changing of the tides? What power can be generated by this moving tide? How much water flowing through the present water-powered generators does it take to produce enough electricity to keep a light burning for an hour, or a toaster going for a minute, etc. How heavy are the electrical transmission wires throughout Juneau? How many telephone poles are there in Juneau? Why are the poles equidistant? Or are they? How much slack is there in the wire between poles? What is the trajectory of the wires in winter versus summer?

7. Population statistical survey: Given a plot of ground of say one acre, find the number of Spruce trees, cedar trees, x bushes, et. al. From this and other population samples, estimate (maybe using aerial photos) the number of _____ in the Juneau area. Justify by averaging over a number of sample plots.

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8. There are many smaller projects that can involve students concerning measurements of themselves or around their schools that are mentioned, for example in John Holt's book, What Will We Do Monday (The name may be askew, but it is something like that.), and there are many others involving running speed, throwing different kinds of balls speed, differences of pace sizes on differently inclined streets (More advanced students might like to find a functional relationship between the slope of the street and the length of a person's pace.), the amount of playground space necessary for a recess full of students to be able to engage in various different types of games, etc.

9. Another fascinating study is the finding of Fibonacci numbers in nature. A number of papers on this subject may be found in the Fibonacci Monthly (or some similar name) put out at St. Mary's College in the San Francisco Bay area. In particular Dr. Alfred has many articles on the subject. As an indication of what is involved (and incidentally the study of Fib. numbers and sequences is a neat study in itself). I'll indicate by a couple of examples. If one counts the branches on a tree as they spiral around toward the top, it turns out that for many varieties of trees the spiralling branches follow a certain pattern that is identical to that of Fib. numbers. Also the spiral on pine cones follow this pattern. Probable spruce cones have a similar pattern, and certain conches or snails can be measured to have spiral lengths that always have the same ratio of lengths, independent of their size.

10. Other areas include finding relationships between the number of branches on trees and the age of the trees. Calculating the weight of fill necessary to finish building outer drive. For various configurations, especially barges, of floating objects find the tonnage carriability without swamping. How many gallons of raw sewage is emptied into the channel daily? How many tons of oxygen is converted into carbon dioxide by respirating people of Juneau, (and in depth study in itself) by respirating plants of Juneau, and compare this with the CO_2 converted by photosynthesis to O_2 by the plants of Juneau. Does this have any bearing on limiting the population of the area, or on the extent of open land needed, or...Another study area could be the shipping of food from Seattle to Juneau. Large numbers always interest children.

11. Food stores: Unit pricing of items is an excellent project for students. Younger children can count the relative numbers of different sizes or brands on the shelves. Still another question is how much fresh food is wasted because of spoilage or handling problems? Would it be valuable (or profitable?) to ship barrel size quantities of foodstuffs (e.g. pickles, pop, beer, etc.) to Juneau for redistribution in smaller quantities?

12. How much money does the school district expend per student for education? What percentage is spent in each of the various ways? Can it be done differently or cheaper? Where does the money come from? I.E. What percentage comes from each source. Ditto on expenditures for the borough and for the State.

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13. Make observations of the geometric shapes of buildings, building supports, bridges, houses, etc. with both esthetics and strength in mind. For younger children the identification of real objects with shapes they study the names of which make the objects more meaningful. Older children can calculate the relative strengths of various shaped supporting structures and compare their observations or justify the things they see in terms of the things they compute.

14. There is an old miner's statement (somewhat analogous to an old wives tale) that you "can't put a hot pipe in cold ground". Since the 70 years or so since this statement was made, much progress has been made technologically so that the pipeline proponents adhere to doing just that which the old miner said was not possible. Justify with appropriate facts and figures, and maybe a couple of experiments thrown in to boot, either the old miner's view or the new oilman's view.

15. In a study of the school as an ecosystem, which is very appropriate for sixth grade level and up many mathematical questions are involved that even younger children may be able to be involved in. More details of this program are available on request.

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RECYCLING FOR RELAXATION

An Environmental Experience For All Grade Levels

Created By: Carolyn Gardner
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Goal: The goal here is to create an awareness of the many possibilities for creative use of the trash that usually ends up in the garbage truck. The many items that can be reused would save money for both the trash thrower and the trash disposal concern. By making it necessary for the students to take a close look at their homes and the type of objects that are leaving their homes to become the pollution problem of their town, their state, and of the nation, they may gain a more definite meaning of the words pollution and recycling. The hope being that the words will no longer mean someone else's problem caused by industry or located only in the big cities, but these words, recycling and pollution, will take on a personal meaning and awarness.

Activity Design:

I. Introduction

A. Discuss pollution and recycling - find out how aware students are of the problems.
B. Bring discussion to local level and then to home level.
C. Identification of the types of trash that might be used instead of going into the carbage can.
D. Discuss means of storing "saved" trash so that it doesn't create a pollution problem in the home, or a fire hazard.

II. Food Waste

There are many ways of using food waste rather than using it to fill the trash can.

A. Seeds of many fruits and vegtables may be used to grow plants -- this is fun for kids to watch a plant grow from their apple seed, also a good method of showing them that fruits and vegtables come from plants.

B. A compost pile is an excellent way to make use of food waste. Discuss briefly the hows and uses of a compost pile. Discuss also the impractical aspect of composting.

C. Use of left overs in creative and nutrional way is a challenge usually bypassed. Discuss different methods of using left-overs in dishes. (This could be a whole unit for a Home Ec. class.)

D. Use of food that is not in good enough condition to serve; eg. fruit, jams and jellies, vegs. soups and stews - citrus peal for candy.

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III. Container Waste

Here there is an inexhaustible source of supply for reuse and creativity.

A. Plastic containers are abundant and almost indestructible, which make them great playthings for children and excellent for recycling.

1. Plastic "bottles" - (eg. dish soap containers, bleach containers) can be used to make hand puppets; or combined with papiermache opens limitless opportunities for creation both at the young child's level and at the High School level.
2. Plastic containers decorated with paint, paper, yarn, ribbon, and string become attractive usable containers rather than trash.
3. A kitchen organizer to hang on the wall can be made of various shaped containers glued to a backing of cork or fiber board.

B. Metal containers constitute a large part of the trash. Note safety precautions when working with metal.

1. The "Old Cansiter Trick"--done with coffee cans. Many different ways of covering them.
2. Cans can be covered with scrapes of yarn for an attractive effect.
3. Cans may be used as candle holders - need metal cutting equipment to cut designs.
4. Can in graduated sizes for toddler play.

C. Glass containers are a bit difficult for young children, but older girls can find many uses for old bottles.

1. Old vitamen bottles can be used in many ways - eg., spice holders, vases, candy jar.
2. Old or unused canning jars for cansiters.
3. Attractive jars for perfumes, vases,etc.
4. Old baby food jars make good organizers for nails,etc.

IV. Paper Waste

I feel that pollution by paper is very high in homes. Discussion of the various forms this type of pollution takes. Discuss ways of cutting down on the paper use or recycling old paper.

A. Newspapers, magazines,etc.: Papiermache is a great way to eliminate old paper; collages, made from pictures, words, old can labels is an easy way to rid the trash of paper. Paper can also be used in composting.

B. Paper containers are very useful and easy to recycle. Cardboard boxes make great playthings for children - their imaginations usually take care of need for decorations.